WORKSHOP MANUAL

MH MOTORCYCLES

MH7 NAKED

IMPORTANT

- **READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS CAREFULLY. THE ESPECIALLY IMPORTANT INFORMATION HAS BEEN INDICATED WITH THE WORDS WARNING, CAUTION AND N.B., WHICH HAVE VERY PRECISE MEANINGS.**

WARNING
CONTAINS A POTENTIAL DANGER THAT MAY CAUSE INJURY OR EVEN DEATH.

CAUTION
WARNING OF POSSIBLE DAMAGE TO THE MACHINE.

N.B.
CONTAINS SPECIAL INFORMATION TO AID MAINTENANCE OR CLARIFY SOME POINT IN THE INSTRUCTIONS.

THIS SERVICE MANUAL HAS BEEN PREPARED FOR AUTHORISED DEALERS OF G. H E MOTORHISPANIA, S.L. AND SHOULD ONLY BE USED BY QUALIFIED TECHNICAL SERVICE DEPARTMENT MECHANICS.

INEXPERIENCED MECHANICS OR THOSE WITHOUT THE APPROPRIATE TOOLS AND EQUIPMENT CANNOT CARRY OUT THE SERVICE WORK DESCRIBED IN THIS MANUAL CORRECTLY.

A POOR REPAIR MAY CAUSE INJURY TO THE MECHANIC, AND THE MACHINE MAY NOT BE IN CONDITION TO GUARANTEE THE SAFETY OF THE RIDER AND PILLION PASSENGERS.

FOREWORD

This manual describes the procedures for the diagnosis, maintenance, adjustments, basic service work, changing of parts and the dismantling and assembly of the main parts.

Model applicable:
MH7 NAKED with the following and subsequent VIN numbers:
VTVNK01E307XXXXXX ~

This text is classified into sections, each of which has a section number, as can be seen in the Contents on the following page, and on the first page of every individual section there is a contents list for that section.

Keep this manual to hand so that it can be consulted quickly when carrying out service work.

The specified points must be carefully observed to ensure that the machine functions perfectly in accordance with the specification.

When changing parts or carrying out service work that involves dismantling, it is recommended to use genuine G.H.E. MOTORHISPANIA, S.L. spare parts, tools and service materials as specified in the corresponding descriptions

All the information, figures and specifications in this manual are based on the latest approved product information available at the time of publication.

The main model used for the description throughout this manual is the model with basic specifications.
The figures may therefore appear slightly different from the model in the workshop. G.H.E. MOTORHISPANIA, S.L. reserves the right to make changes without prior warning.

G.H.E. MOTORHISPANIA. S.L.
SERVICE DEPARTMENT

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1 GENERAL INFORMATION

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Engine identification 9

1 GENERAL INFORMATION

IDENTIFICATION

CHASSIS IDENTIFICATION NUMBER

The chassis identification number is located at the front right-hand side of the machine.

The chassis number is required when requesting any motorcycle part.

ENGINE IDENTIFICATION NUMBER

The engine identification number is located at the top right-hand side of the engine.

The engine number is required when requesting any engine part.

2 SPECIFICATIONS

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2 SPECIFICATIONS

GENERAL SPECIFICATIONS

ELEMENT	SPECIFICATIONS
MODEL CODE	MH7 NAKED 125cc
DIMENSIONS Total length:	1980 mm
Total width	750 mm
Height without rear-view mirrors	795 mm
Distance between axles	1310 mm
WEIGHT	120 kg

2 SPECIFICATIONS

CHASSIS SPECIFICATIONS

ELEMENT	SPECIFICATIONS
WHEELS	
Front wheel	2,75 x 17"
Front tyre	Continental 100/ 80 - 17
Front pressure	1,5 bar
Rear wheel	3 x 17"
Rear tyre	Continental 130/70 - 17
Rear pressure	2 bar
FRONT BRAKE	
Type	Hydraulic disk, radial calliper
ø brake pistons	25 mm
ø of disk	Ø 300mm
Thickness of disk	4±1
ø main piston (cylinder)	Ø 11mm
REAR BRAKE	
Type	Hydraulic disk
ø brake pistons	Ø 25mm
ø of disk	Ø 220mm
Thickness of disk	4±1 mm
ø main piston (cylinder)	Ø 12mm
FRONT SUSPENSION	
Type of suspension:	Hydraulic telescopic forks
Type of front forks	41 mm inverted; advanced shaft
Forks capacity	360±4 cc
Travel	90 mm
REAR SUSPENSION	
Type of suspension	Swinging arm with single central shock absorber
Central hydraulic single shock absorber travel	45±2 mm
STEERING	
Tipo	Column mounted on ball bearings

2 SPECIFICATIONS

ENGINE SPECIFICATIONS

ELEMENT	SPECIFICATIONS
ENGINE	
Type of engine	Single cylinder 4-stroke
Make	YAMAHA
Cubic capacity	123,7 cc
Diameter x stroke	54 mm X 54 mm
Maximum power	7,5 Kw a 9000 min-1
Maximum torque ratio	9,4 Nm a 6500 min-1
FUEL	
Recommended fuel	95 or 98 octane lead free petrol
Total capacity of fuel tank (including reserve)	12.5 litres
LUBRICACIÓN	
Recommended oil	10W30
Oil tank capacity	1 Litre
COOLING	
Type	Air
IGNITION	
Type	Electric
Spark plug	NGK; CR6HSA
CARBURETTOR	
Type	MIKUNI 3D6/10
Main jet	#95
Idling jet	#15
Needle / Position	5QGJ3 / 2
Float height	18,9 mm
Air screw position	1 1/2 turns
TRANSMISSION	
Type	Primary by gears Final by chain
Primary transmission	Gears; 68 x 20
Secondary transmission	Chain; 52 x 14
Gearbox	5 speed
Gearbox capacity	1,2
Clutch	Multidisk- multidisks bathed in oil with manual control.
MAGNETO	MORIC; 3D9
STARTER MOTOR	Electric/Kick-start lever

2 SPECIFICATIONS

TIGHTENING TORQUES

ITEM	TIGHTENING TORQUE
BODYWORK	
Side covers	0,1 daN·m (1 N·m)
Front mudguards	0,1 daN·m (1 N·m)
Rear mudguards	0,8/0,1 daN·m (8/1 N·m)
Skirting	0,8/0,1 daN·m (8/1 N·m)
CHASSIS	
Front wheel shaft	4,5 daN·m (45 N·m)
Front wheel shaft clamp	1,2 daN·m (12 N·m)
Rear wheel shaft nut	6,5 daN·m (65 N·m)
Suspension arm nut	6,5 daN·m (65 N·m)
Engine chassis mounting	2,8 daN·m (28 N·m)
Shock absorber top mounting	4,3 daN·m (43 N·m)
Shock-absorber base mount	4,3 daN·m (43 N·m)
Forks T-sections	1,5 daN·m (15 N·m)
Front brake calliper	2,5 daN·m (25 N·m)
Rear brake calliper	2,5 daN·m (25 N·m)
Front brake disk	1 daN·m (10 N·m)
Rear brake disk	1 daN·m (10 N·m)
Support on chassis	1,9 daN·m (19 N·m)
Steering lock	0,6 daN·m (6 N·m)
STANDARD	
5 mm diameter bolt and nut	0,5 daN·m (5 N·m)
6 mm diameter bolt and nut	1 daN·m (10 N·m)
8 mm diameter bolt and nut	2,2 daN·m (22 N·m)
10 mm diameter bolt and nut	3,5 daN·m (35 N·m)
12 mm diameter bolt and nut	5,5 daN·m (55 N·m)

3 COMMISSIONING

CONTENTS

COMMISSIONING

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Commissioning the fuel and oil circuits 20

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3 COMMISSIONING

PREPARING THE BATTERY (EXCEPT MAINTENANCE-FREE BATTERIES)

Regarding use of electrolyte, please read this manual carefully and fill the electrolyte liquid correctly, making sure not to spill any.

WARNING:
Check to make sure the electrolyte is the same type as in the battery.
The electrolyte must always be filled with the battery removed from the machine.
The fitting of bolts and nuts must be carried out after filling with electrolyte.

PREPARING THE BATTERY:
Place the battery on a flat surface and remove the filling orifice seal.

PREPARING THE ELECTROLYTE:
Remove the electrolyte container from the PVC wrapping and remove the top cover by sliding sideways.

FILLING THE BATTERY WITH ELECTROLYTE:
Fit the electrolyte container vertically into the battery filling orifice and push in with a single movement. This will cause the seal to break and allow the liquid filling to begin.
N.B.: The electrolyte container needs to be correctly inserted, otherwise the battery may fall over or the sulphuric acid may spill out

PLEASE CHECK THE FOLLOWING:
That bubbles are emerging from the 6 reservoirs.
That the liquid level is falling gradually.
Allow to stand for 10 minutes (no more than 12 hours)
N.B.: If there are places where no bubbles are emerging, the liquid can be encouraged to enter by tapping this part with the finger without removing the electrolyte container.

REMOVING THE ELECTROLYTE CONTAINER:
Check once again that no electrolyte is remaining. If there is electrolyte remaining, tap the container gently.
Remove the electrolyte container carefully.
Clean off any electrolyte that may have splashed onto the battery.

FITTING THE HERMETIC PLUG:
Remove the hermetic plug fitted to the battery and position it gently horizontally lined up with the liquid filling orifice.
Push down several times with both hands on the 6 parts until it is at the same level as the top of the battery.
N.B.: Do not adopt the method of pushing each hermetic plug once.

PRECAUTIONS FOR HANDLING:
Take care that the electrolyte does not come into contact with the skin or eyes when filling the battery.
In the event of electrolyte coming into contact with clothing or skin, the affected part must be washed immediately with plenty of water and then washed with soap and water.
In the event of electrolyte coming into contact with the eyes, the effected eye must be washed immediately with running water and the nearest medical personnel contacted.
Before disposing of the container, it should be made safe by diluting the contents in water or neutralising it and then washing the contents with water.
Sulphuric acid: 41%
Specific weight: 1.32

3 COMMISSIONING

WARNING
NEXT, THE BATTERY LEVEL MAY NEED TO BE ESTABLISHED AFTER A COMPLETE CHARGE, USING EXCLUSIVELY DISTILLED WATER.

CHECKING LEVELS

1) Check the gearbox oil level.

2) Check the coolant level.

3) Check the brake fluid level.

COMMISSIONING THE FUEL AND OIL CIRCUITS

1) Start up the engine and check that it is running correctly.

2) Fill the tank up with 95 or 98 octane lead-free petrol

CHECKS BEFORE DELIVERY TO CUSTOMER

1) Check the tightness of the wheel nuts.

Front wheel shaft nut tightening torque:
1,2 daN.m (12 N.m)

Rear wheel shaft nut tightening torque:
6,5 daN.m (65 N.m)

2) Check tightness of nuts and bolts (see Tightening torques).

3) Check the adjustment and effectiveness of the brakes.

4) Check the inflation pressure of the tyres when cold.

Front tyre inflation pressure:
1,5 bars

Rear tyre inflation pressure:
2 bars

5) Check that the lights, the turn indicators, the horn and the brake light are functioning correctly.

6) Check the functioning of the different indicator lights.

7) Carry out a road test.

4 CHASSIS

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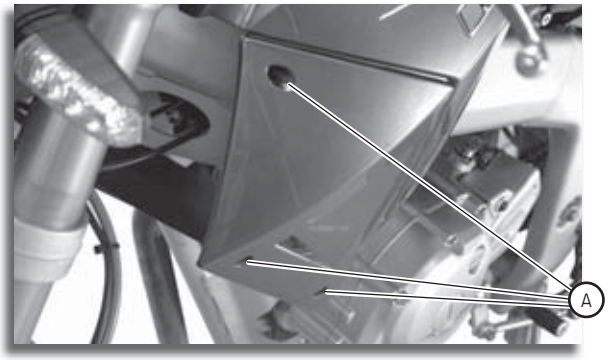
4 CHASSIS

Allen key

FRONT COVERS

REMOVAL

- Unscrew the 3 Allen bolts (A) on each end of the cover.
- Remove the front cover



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CAUTION
WHEN YOU REMOVE THE COVERS, LEAVE THEM FACING UPWARDS TO AVOID DAMAGING THE PAINTWORK

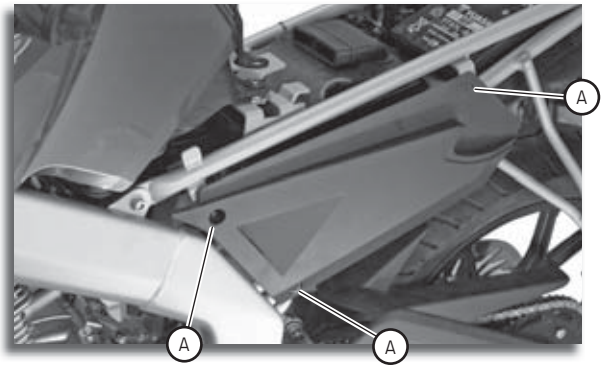
Allen key

CENTRAL COVERS

REMOVAL

- Remove the seat (see section).

- Unscrew the 3 Allen bolts (A) on each end of the cover.
- Remove the central cover.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CHASSIS

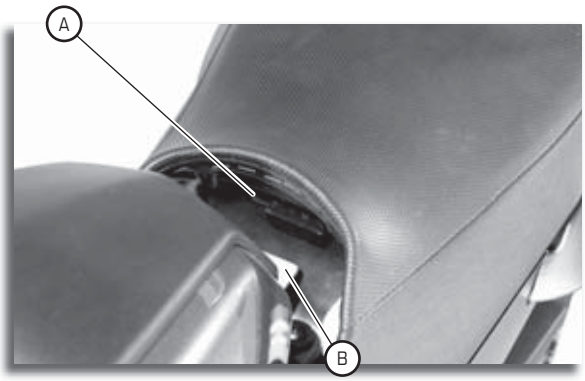
SEAT

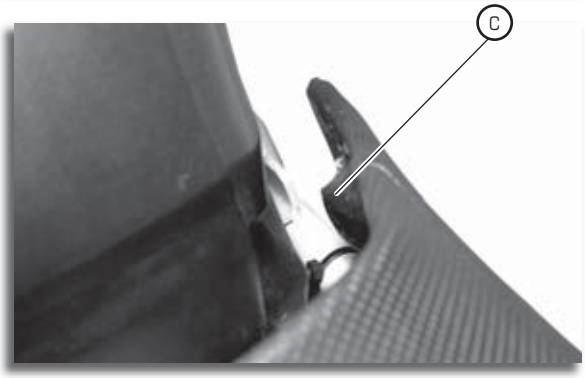
REMOVAL

- Insert the key in the lock and turn 90° to the left.
- Pull the seat upwards and backwards.

ASSEMBLY

- Fit the central tab (A) under the flange (B).
- At the same time, fit the two anchorages (C), located on both sides of the seat, onto the chassis securing flanges.
- Lower the back of the seat.
- Turn the key 90° to the right and remove it.





4 CHASSIS

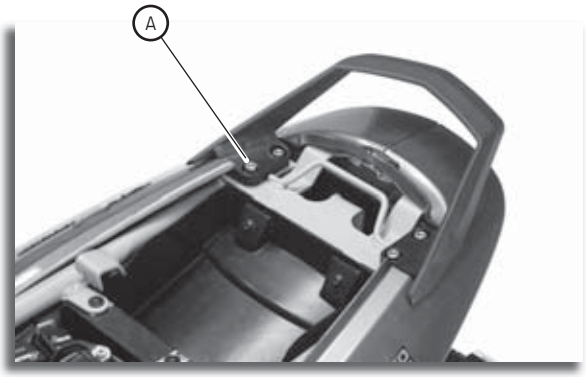
Allen key

PILLION PASSENGER SEAT

REMOVAL

- Remove the seat **(see section).**

- Unscrew the 4 Allen bolts (A).
- Remove the pillion passenger seat.



ASSEMBLY

- Fit the pillion passenger seat in its position.
- Screw on the 4 Allen bolts and 4 washers.
- Fit the seat **(see section).**

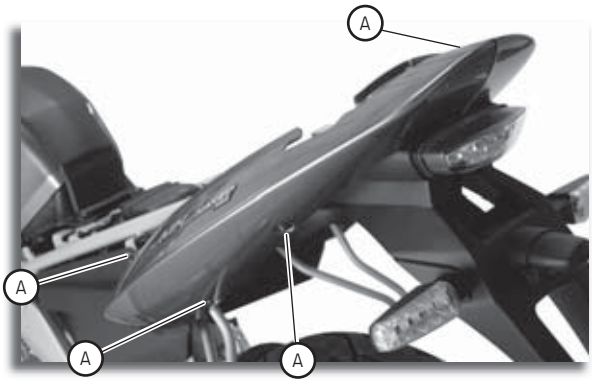
Allen key

REAR COWLING

REMOVAL

- Remove the seat **(see section).**
- Remove the pillion passenger seat **(see section).**

- Unscrew the 4 Allen bolts (A).
- Remove the cowling.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CAUTION
WHEN YOU REMOVE THE COVERS, LEAVE THEM FACING UPWARDS TO AVOID DAMAGING THE PAINTWORK.

CHASSIS

GRILL

REMOVAL

- Remove the front covers **(see section).**
- Remove the grill, by pulling upwards.

ASSEMBLY

- To assemble, carry out the operations in reverse order.

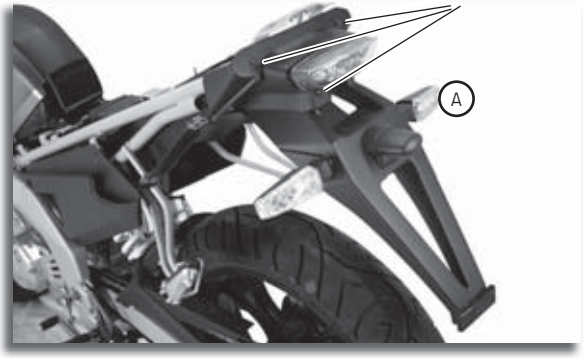
Allen key

NUMBER PLATE

REMOVAL

- Remove the seat **(see section).**
- Remove the pillion passenger seat **(see section).**
- Remove the right and left-hand rear cowling **(see section).**
- Remove the turn indicators **(see section).**
- Remove the rear light **(see section).**

- Unscrew the 3 Allen bolts (A).
- Remove the number plate.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

4

CHASSIS

Allen key

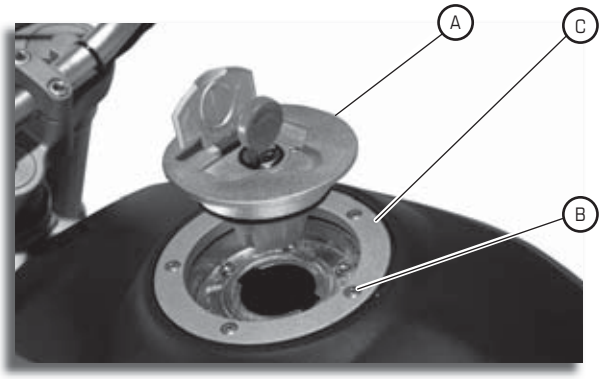
Llave Torck

FUEL CAP

REMOVAL

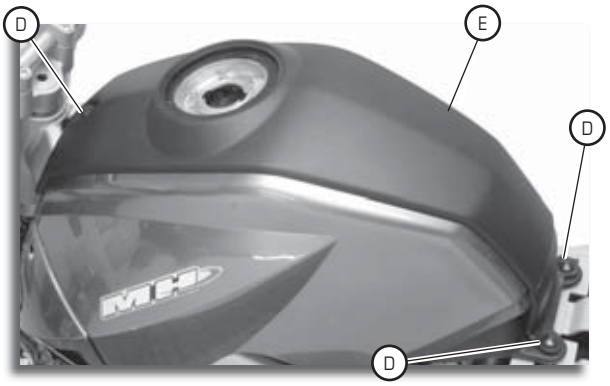
- Remove the cap (A).
- Unscrew the 5 Allen bolts (B).
- Remove the support orifice(C).
- Unscrew the 3 screws (D) from the cover.
- Remove the top tank cover (E).
- Remove the joining seal (F).
- Unscrew the 6 Allen bolts (G).

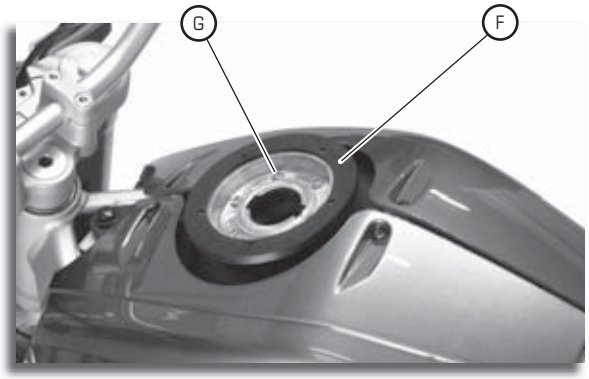
- Remove the tank filler hole.
- Remove the tank filler hole rubber seal.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

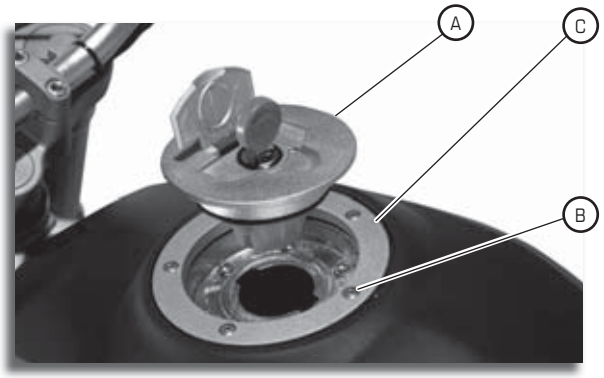




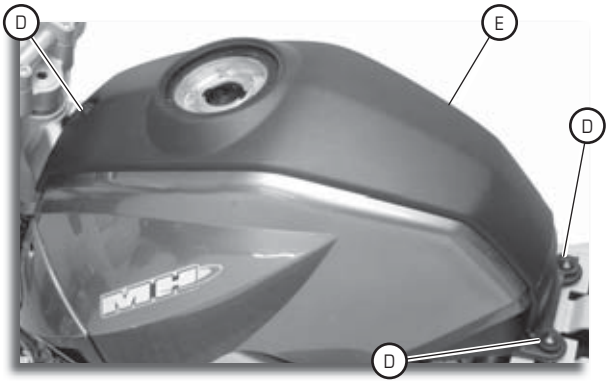
TANK COVERS

REMOVAL

- Remove the seat **(see section).**
- Remove the front covers **(see section).**



- Remove the cap (A).
- Unscrew the 5 Allen bolts (B).
- Remove the support orifice(C).
- Unscrew the 3 bolts (D) from the central cover.
- Remove the cover (E).
- Unscrew the 4 bolts (F) from the side cover.
- Remove the covers.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CAUTION
WHEN YOU REMOVE THE COVERS, LEAVE THEM FACING UPWARDS TO AVOID DAMAGING THE PAINTWORK.

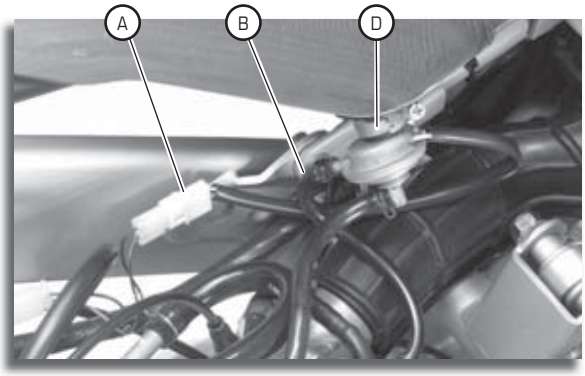
4 CHASSIS

Phillips screwdriver

FUEL TANK

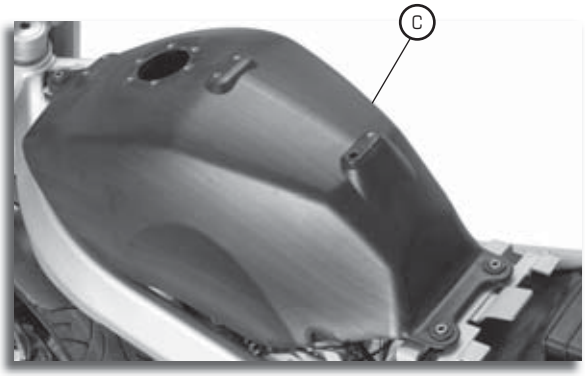
REMOVAL

- Remove the seat **(see section).**
- Remove the front covers **(see section).**
- Remove the fuel cap **(see section).**
- Remove the tank covers **(see section).**



- Disconnect the tap from the general wiring (A).
- Remove the pipe (B) from the tap.

- Remove the tank (C).
- Unscrew the clamp (D) and remove the tap.



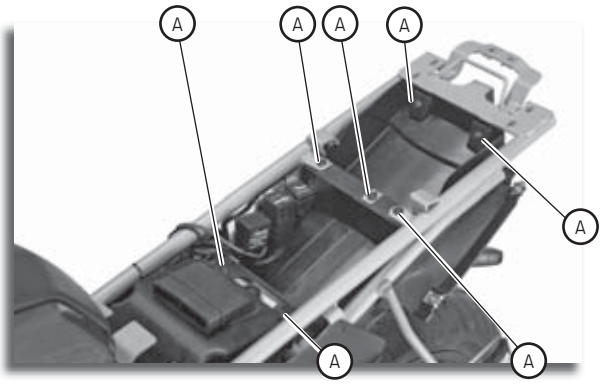
N.B.
PLACE A CONTAINER UNDERNEATH TO DRAIN THE FUEL TANK.

ASSEMBLY

- To assemble, carry out the operations in reverse order.

Allen key

BATTERY SUPPORT



REMOVAL

- Remove the seat **(see section).**
- Remove the pillion passenger seat **(see section).**
- Remove the right and left-hand rear cowlings **(see section).**
- Remove the number plate **(see section).**
- Remove the battery **(see section).**

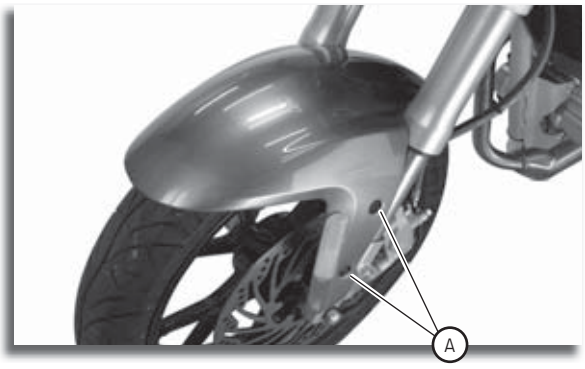
- Unscrew the 7 bolts (A).
- Remove the support.

ASSEMBLY

- To assemble, carry out the operations in reverse order.

Allen key

FRONT MUDGUARD



REMOVAL

- Unscrew the 4 bolts (A).
- Remove the front mudguard.

ASSEMBLY

- To assemble, carry out the operations in reverse order.

CAUTION
WHEN YOU REMOVE THE COVERS, LEAVE THEM FACING UPWARDS TO AVOID DAMAGING THEPAINT-WORK

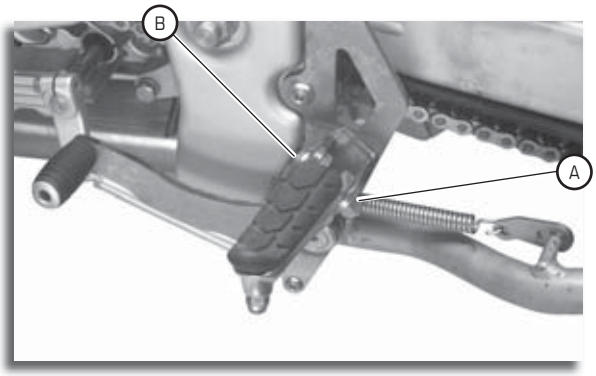
4 CHASSIS

Allen key

FRONT FOOTRESTS

REMOVAL

- Unscrew the nut (A).
- Remove the bolt Allen (B).
- Remove the footrests.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

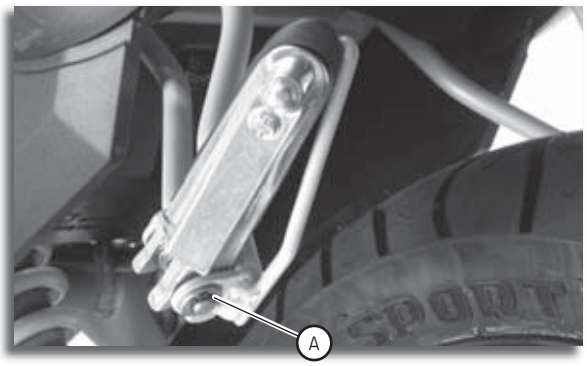
Callipers

REAR FOOTRESTS

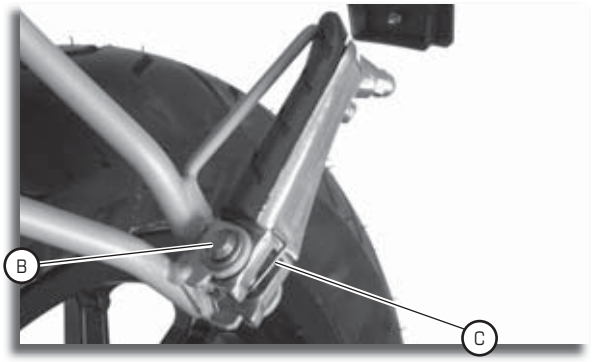
REMOVAL

- Remove the clip and the washer (A).
- Remove the key (B) and the washer.
- Remove the spring (C).
- Remove the footrest.

N.B.
REMEMBER THE POSITION OF THE SPRING FOR ITS SUBSEQUENT REFITTING.



WARNING
SECURE THE SPRING WHEN REMOVING THE KEY.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CHASSIS

Set spanner

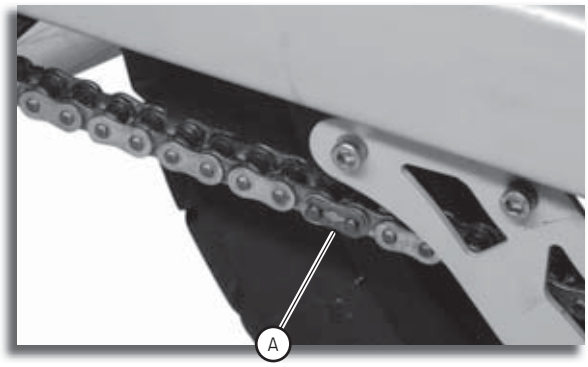
Allen key

CHAIN

REMOVAL

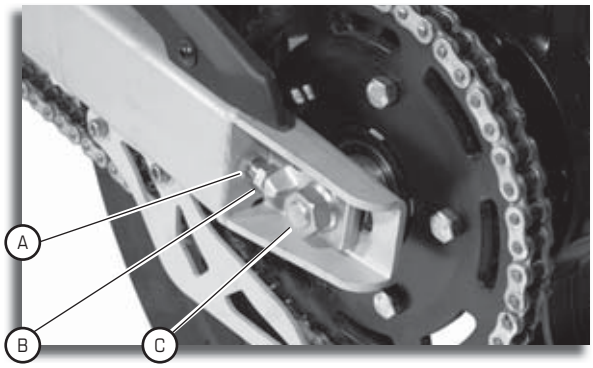
- Situate the securing clip de (A) where it can be seen.
- Remove the securing clip.
- Remove the chain, by pulling it out.

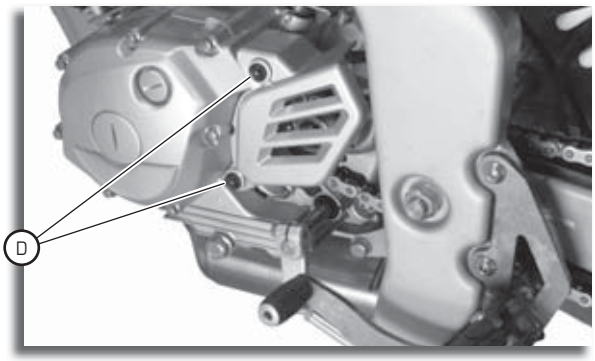
N.B.
THE MACHINE MUST BE ON A SUPPORT WITH THE GEAR IN NEUTRAL.



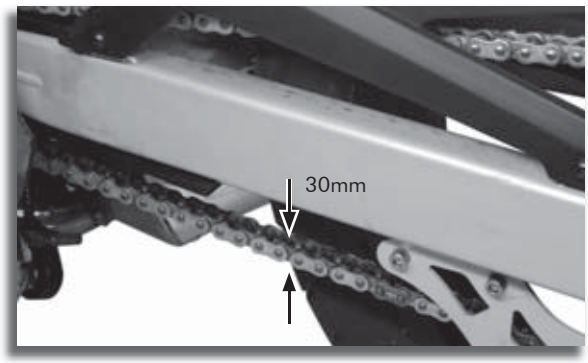
ASSEMBLY

- Loosen the tensioner locking nut (A).
- Tighten the bolt (B) right to the end.
- Loosen the 2 shaft nuts (C).
- Push the wheel forwards.
- Remove the sprocket protector D).
- Fit the chain onto the front sprocket and the rear sprocket.
- Fit the securing clip.
- Adjust the tensioners.
- Fit the 2 wheel shaft nuts.





N.B.
THE CHAIN SHOULD HAVE A LOOSE PLAY OF 30mm.



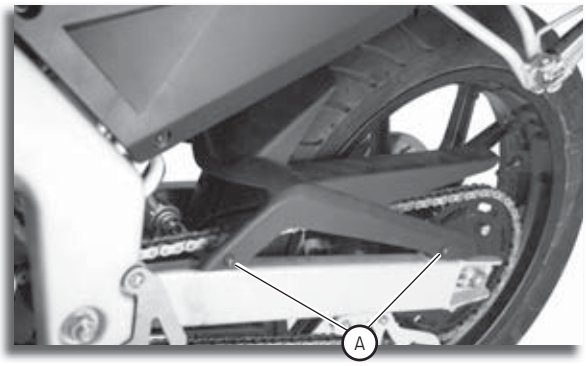
4 CHASSIS

Allen key

CHAIN PROTECTOR

REMOVAL

- Unscrew the 4 bolts (A).
- Remove the protector.



ASSEMBLY

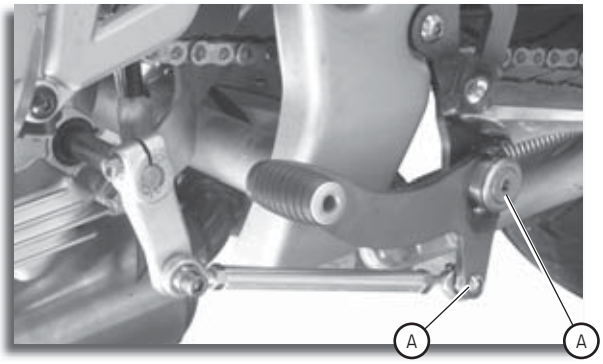
- To assemble, carry out the operations in reverse order.

Allen key

GEAR CHANGE PEDAL

REMOVAL

- Unscrew the 2 bolts (A).
- Remove the gear change pedal.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CHASSIS

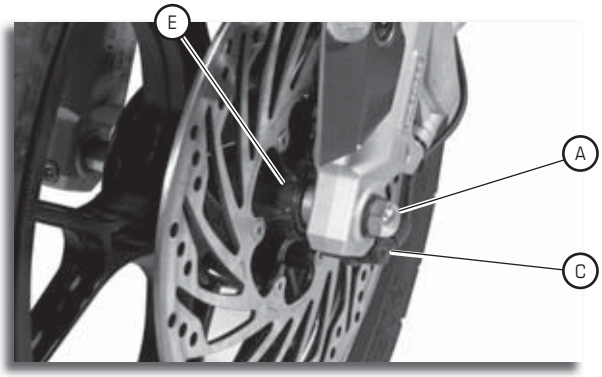
Set spanner

Allen key

FRONT WHEEL

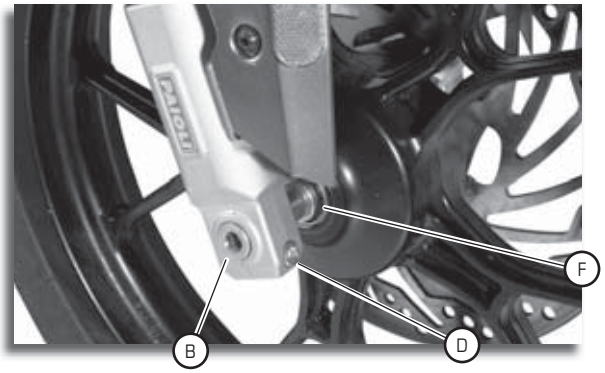
REMOVAL

- Remove the front mudguards **(see section).**
- Remove the (A) left-hand side wheel shaft nut (B)
- Remove the mileometer take-off (C).
- Loosen the bolt (D) on the right-hand fork arm securing the shaft (B).
- Extract the wheel (B) until the separator (E), the wheel and the separator (F) are freed.



WARNING
-PLACE THE MACHINE ON A FLAT SURFACE.
-STAND THE MACHINE ON A SUITABLE SUPPORT, IN SUCH A WAY THAT THE FRONT WHEEL IS OFF THE GROUND.

N.B.
PAY MAXIMUM ATTENTION TO THE POSITION OF THE SEPARATING BUSHES. DO NOT APPLY THE BRAKE PEDAL DURING THIS OPERATION IF YOU DO SO, YOU WILL NEED TO DRAIN THE BRAKE FLUID AND OPEN THE PAD TO REINSERT THE BRAKE DISK WHEN REFITTING THE WHEEL.



ASSEMBLY

- Insert the shaft (B) into the right-hand fork arm.
- Insert the separator (F) on the shaft.
- Fit the wheel and insert the shaft (B).
- Insert the separator (E).
- Insert the shaft (B) into the left-hand fork arm.
- Fit the mileometer take-off (C).
- Fit the nut (A) and tighten it.
- Fit the shaft with the bolt (D).
- Fit the front mudguards **(see section).**

4 CHASSIS

Set spanner

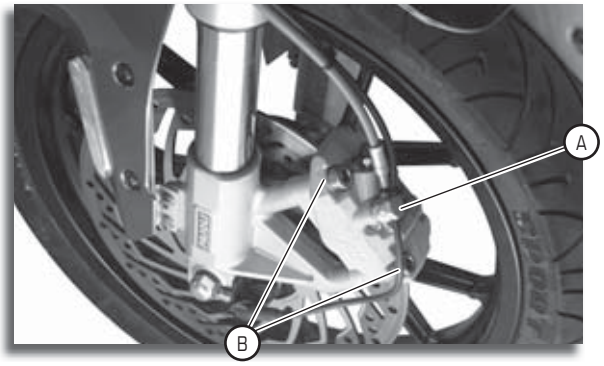
Allen key

FRONT BRAKE CALLIPER

REMOVAL

- Unscrew the banjo bolt (A) from the bottom end of the brake hose.
- Drain the brake fluid.
- Unscrew the 2 bolts (A) and washers.
- Remove the calliper.

N.B.
PLACE A CONTAINER UNDERNEATH TO DRAIN THE FLUID.



ASSEMBLY

- Fit the calliper.
- Secure with the 2 bolts (B) and washers.
- Fit the banjo bolt (A).
- Refill the fluid reservoir **(see section).**

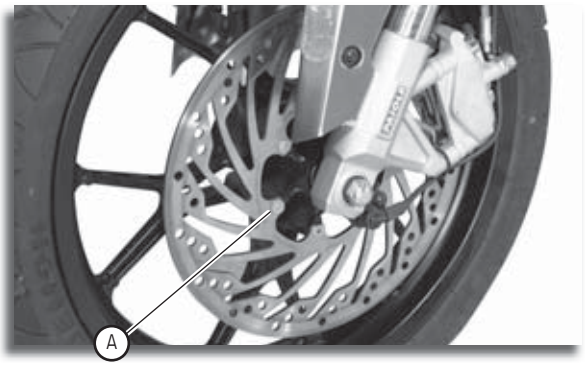
Allen key

FRONT BRAKE DISK

REMOVAL

- Remove the front wheel (see section).
- Unscrew the 6 bolts (A).

- Remove the disk.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

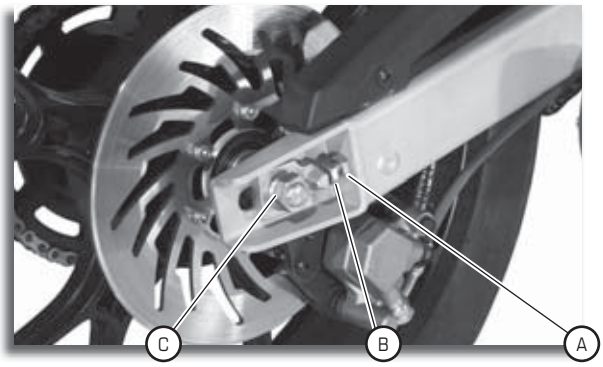
Set spanner

Allen key

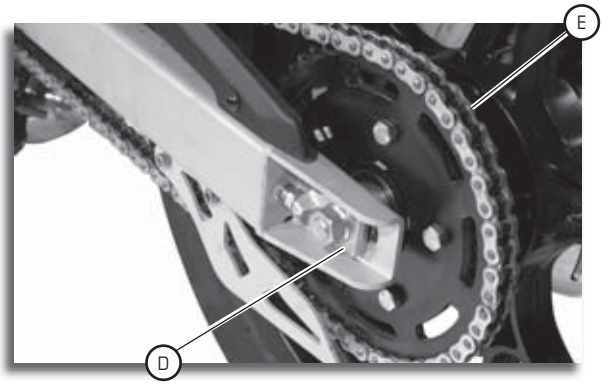
REAR WHEEL

REMOVAL

- Loosen the tensioner locking nut (A).
- Tighten the bolt (B) right down.
- Remove the 2 nuts (C) from the shaft.
- Remove the 2 tensioners (D).
- Push the wheel forwards.
- Remove the chain (E).
- Pull the shaft to free the brake calliper - support.
- Pull the shaft to free the separator, the wheel and the other separator.



WARNING
-PLACE THE MACHINE ON A FLAT SURFACE.
-STAND THE MACHINE ON A SUITABLE SUPPORT, IN SUCH A WAY THAT THE REAR WHEEL IS OFF THE GROUND.



N.B.
PAY MAXIMUM ATTENTION TO THE POSITION OF THESEPARATING BUSHES.
DO NOT APPLY THE BRAKE PEDAL DURING THIS OPERATION. IF YOU DO SO, YOU WILL NEED TO DRAIN THE BRAKE FLUID AND OPEN THE PADS TO REINSERT THE BRAKE DISK WHEN REFITTING THE WHEEL.

4 CHASSIS

Set spanner

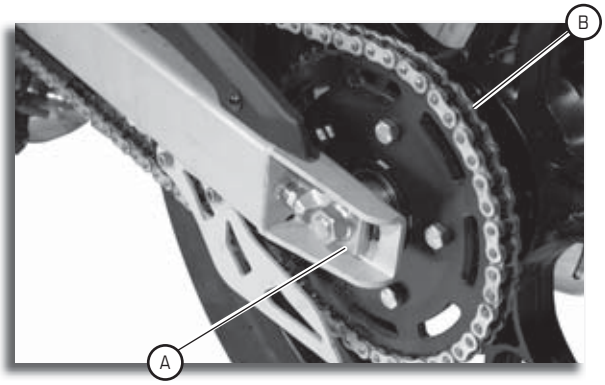
Allen key

REAR WHEEL

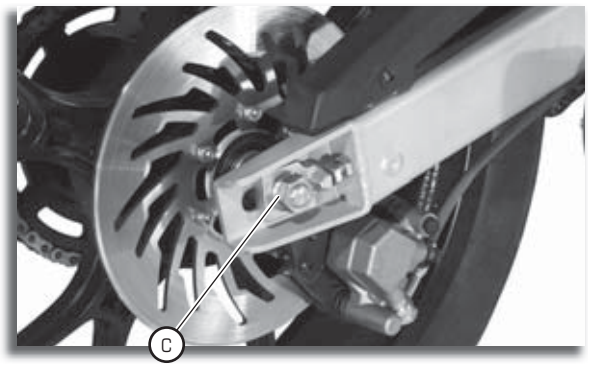
ASSEMBLY

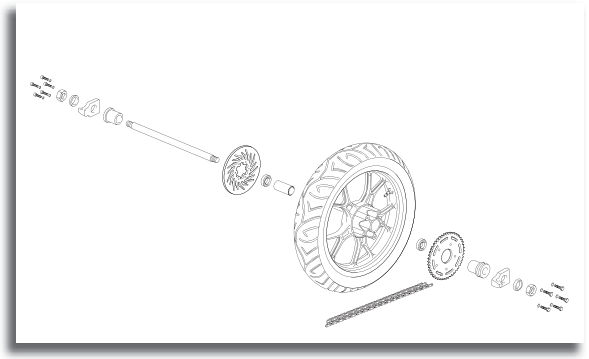
N.B.
FIT THE TENSIONERS IN THEIR CORRECT POSITION.

- Fit the tensioner (A) on the swinging arm.
- Insert the shaft in the tensioner.
- Fit the brake calliper - support.
- Fit the separator.
- Fit the wheel.
- Insert the shaft through to the other side of the wheel.



- Fit the chain (B) on the sprocket.
- Fit the other separator.
- Insert the shaft through to the other side of the swinging arm.
- Fit the tensioner.
- Tighten the chain tension **(see section).**
- Fit the 2 wheel shaft nuts (C).





Set spanner

Allen key

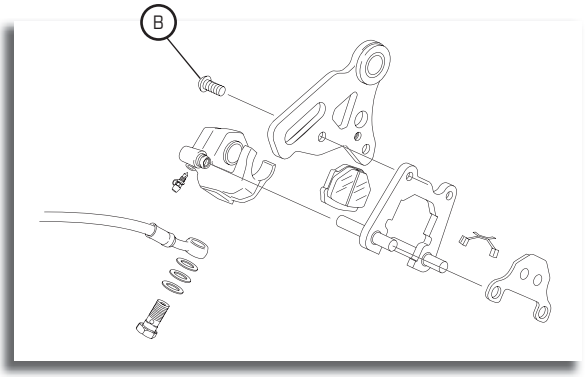
REAR BRAKE CALLIPER

REMOVAL

- Unscrew the banjo bolt (A) from the bottom end of the brake hose.
- Drain the brake fluid.
- Remove the rear wheel **(see section).**

- Unscrew the 2 bolts (B) securing the support.
- Remove the calliper.

N.B.
PLACE A CONTAINER UNDERNEATH TO DRAIN THE FLUID.



ASSEMBLY

- Fit the banjo bolt (A).
- Fit the calliper on the support.
- Fit the calliper - support on the swinging arm, using the bolts (B).
- Fit the rear wheel (see section).
- Refill the fluid reservoir **(see section).**

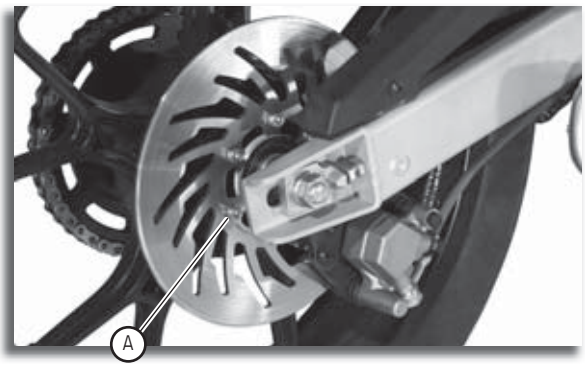
Set spanner

REAR BRAKE DISK

REMOVAL

- Remove the front wheel **(see section).**
- Unscrew the 6 bolts (A).

- Remove the disk.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

4 CHASSIS

Phillips screwdriver

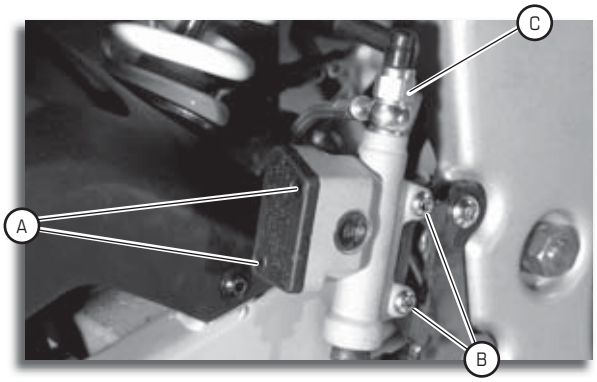
Allen key

REAR BRAKE FLUID RESERVOIR

REMOVAL

- Open the reservoir cover (A).
- Drain the fluid.
- Unscrew the banjo bolt (C).

- Unscrew the 2 bolts (B).
- Remove the reservoir.



N.B.
PLACE A CONTAINER UNDERNEATH TO DRAIN THE FLUID.

ASSEMBLY

- Refill the fluid reservoir **(see section).**

- Fit the fluid reservoir with the 2 bolts (B)
- Fit the banjo bolt (C).

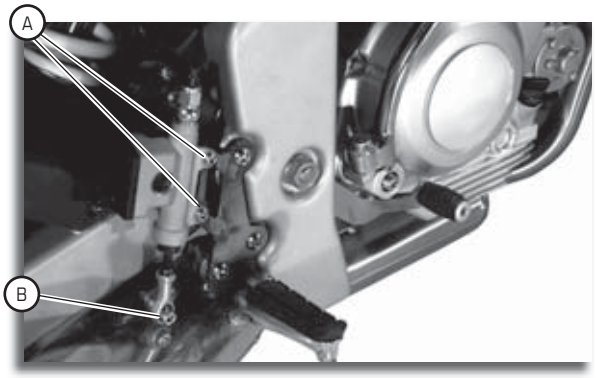
Set spanner

Allen key

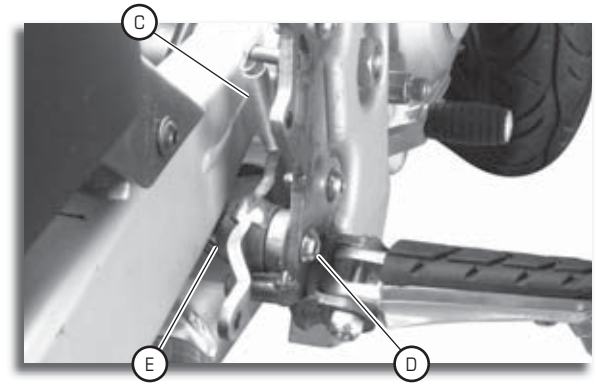
REAR BRAKE LEVER

REMOVAL

- Remove the 2 bolts (A) securing the fluid reservoir to the support.
- Remove the bolt and the nut (B).
- Remove the spring (C).
- Unscrew the bolt (D) and the nut (E) securing the lever to the support and remove it.



N.B.
TO REMOVE THE BRAKE LEVER, REMOVE THE CENTRAL, EXHAUST PIPE NUT.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

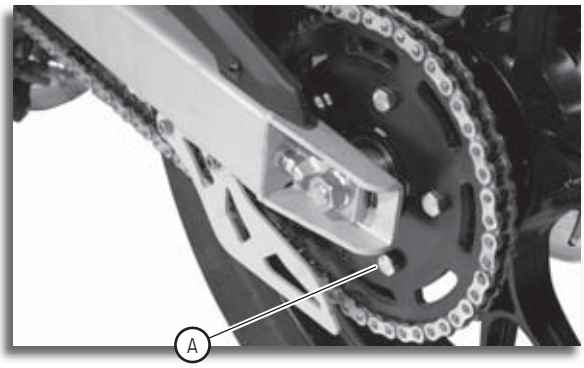
Set spanner

REAR SPROCKET

REMOVAL

- Remove the rear wheel **(see section).**

- Unscrew the 5 bolts (A).
- Remove the rear sprocket.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

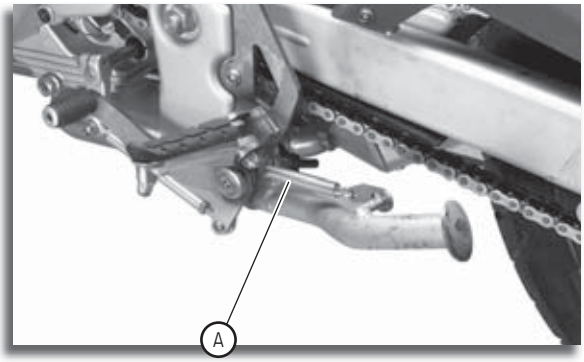
Set spanner

PROP-STAND

REMOVAL

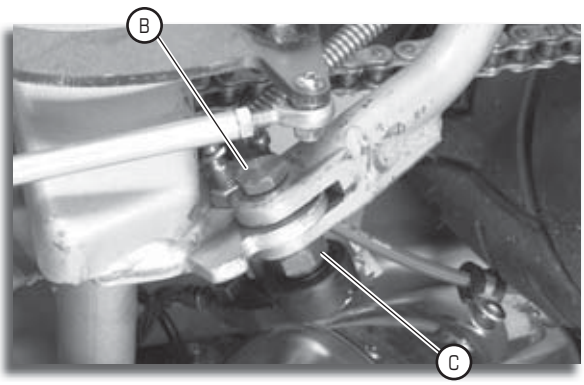
- Remove the spring (A).
- Unscrew the bolt (B) securing the nut (C) on the inside.

- Remove the prop-stand.



ASSEMBLY

- To assemble, carry out the operations in reverse order.



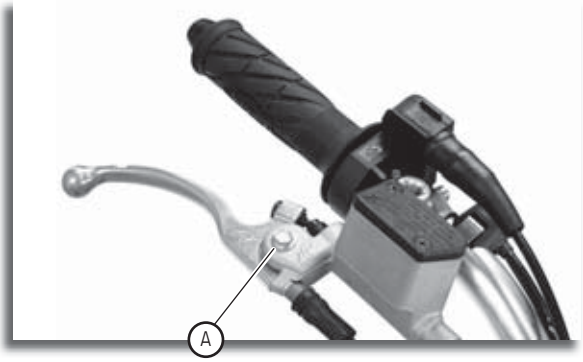
4 CHASSIS

Allen key

FRONT BRAKE LEVER

REMOVAL

- Unscrew the bolt (A) and the securing nut.
- Remove the lever.



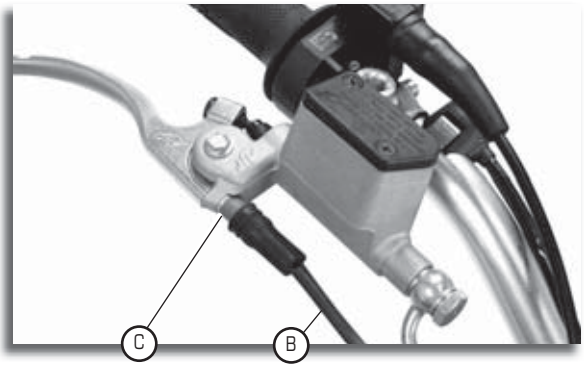
ASSEMBLY

- To assemble, carry out the operations in reverse order.

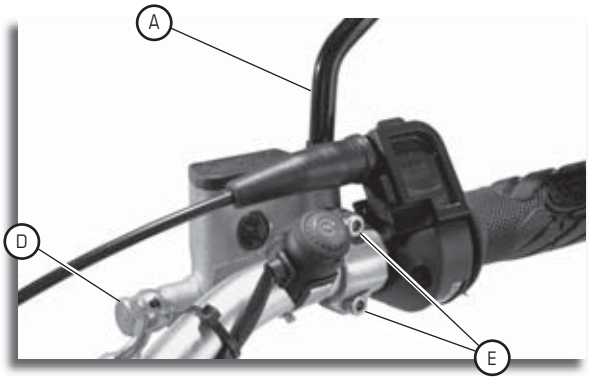
Allen key

FRONT BRAKE FLUID RESERVOIR

- Remove the rear-view mirror (A).
- Unscrew the brake cable (B).
- Remove the rear brake switch (C).
- Remove the lever **(see section).**
- Unscrew the banjo bolt (D).
- Drain the brake fluid.
- Unscrew the 2 Allen bolts (E) from the clamp.
- Remove the brake reservoir



N.B.
PLACE A CONTAINER UNDERNEATH TO DRAIN THE FLUID



ASSEMBLY

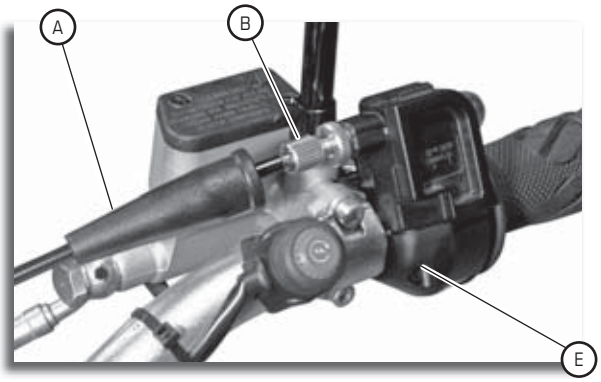
- To assemble, carry out the operations in reverse order.
- Refill the fluid reservoir **(see section).**

Allen key

THROTTLE CONTROL

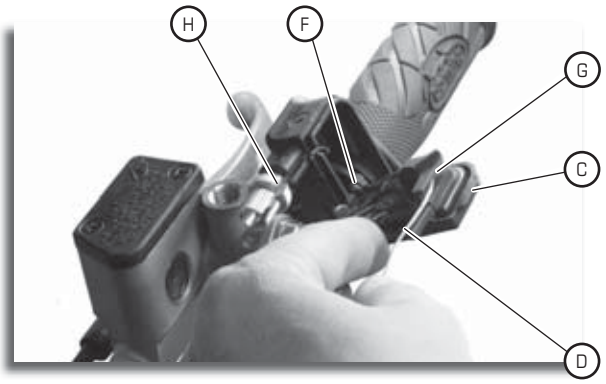
REMOVAL

- Remove the protective rubber (A).
- Loosen the throttle cable tensioner (B).
- Remove the cover (C).
- Disconnect the cable (D).
- Unscrew the 2 Allen bolts (E) from the clamp.
- Remove the throttle control.



ASSEMBLY

- Fit the cable terminal (F).
- Fit the cable through the cover guide (G).
- Fit the cable through the tensioner cut-out (H).



Screwdriver

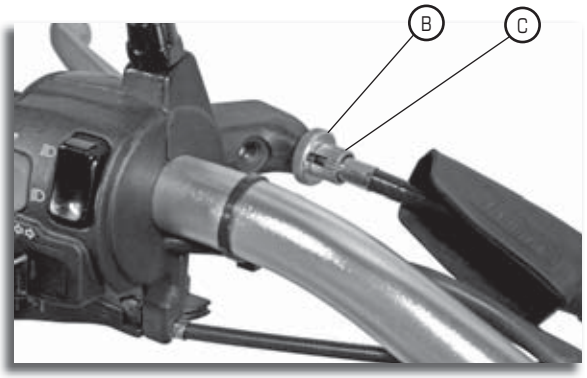
CLUTCH LEVER

REMOVAL

- Remove the rubber (A).
- Loosen the cable tensioner (B).
- Remove the cable (C).
- Unscrew the bolt and the nut (D) from the securing bracket.
- Remove the lever.

ASSEMBLY

- To assemble, carry out the operations in reverse order.



4 CHASSIS

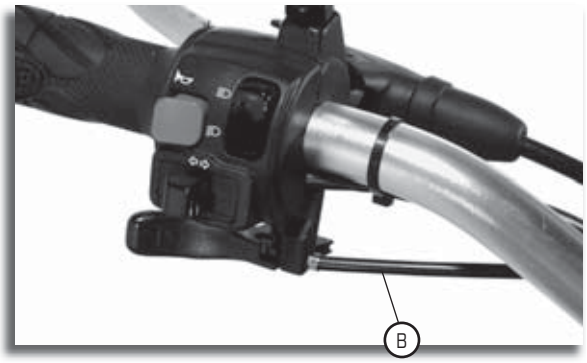
Allen key

COMMUTATOR

REMOVAL

- emove the rear-view mirror (A).
- Remove the choke cable (B).
- Remove the clutch lever **(see section).**
- Unscrew the 2 bolts (C).

- Remove the commutator.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

Phillips screwdriver

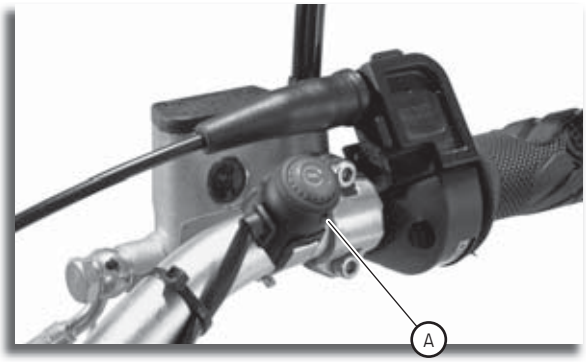
Allen key

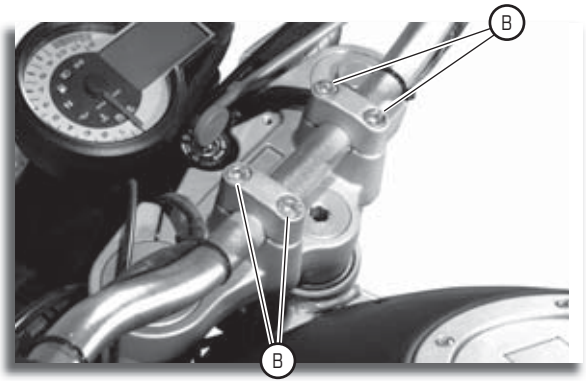
HANDLEBARS

REMOVAL

- Remove the front brake reservoir **(see section).**
- Remove the commutator **(see section).**
- Remove the electric start button (A).

- Unscrew the 4 securing clamp bolts (B).
- Remove the handlebars.





ASSEMBLY

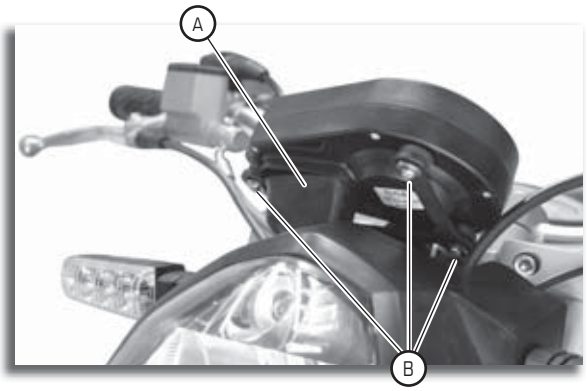
- To assemble, carry out the operations in reverse order.

Phillips screwdriver

INSTRUMENT PANEL

REMOVAL

- Disconnect from the general wiring (A).
- Unscrew the 3 support bracket bolts (B).
- Remove the instrument panel.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

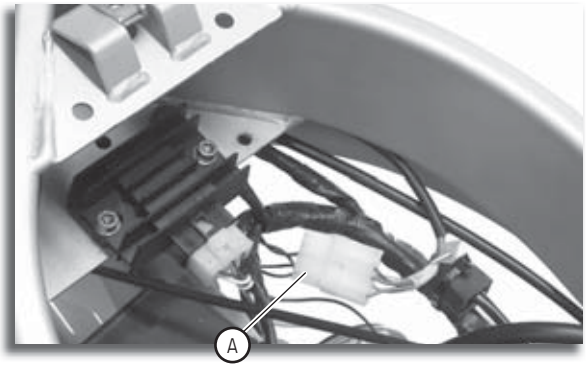
Allen key

IGNITION SWITCH

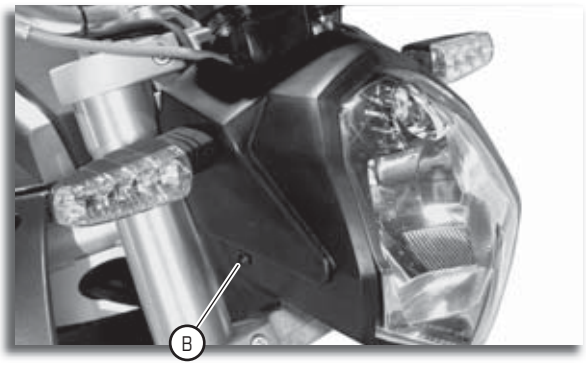
REMOVAL

- Disconnect from the general wiring (A).

N.B.
TO AID THE OPERATION, REMOVE THE TANK.

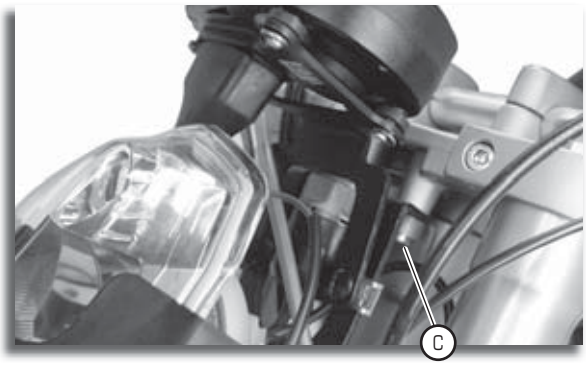


- Unscrew the 2 headlight housing bolts (B).
- Remove the headlight housing.
- Unscrew the 2 bolts (C).
- Remove the switch.



ASSEMBLY

- To assemble, carry out the operations in reverse order.



4

CHASSIS

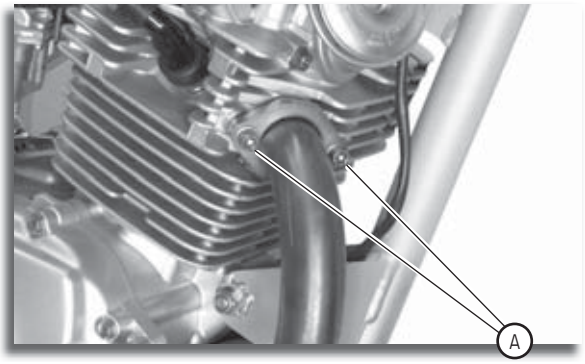
Set spanner

Allen key

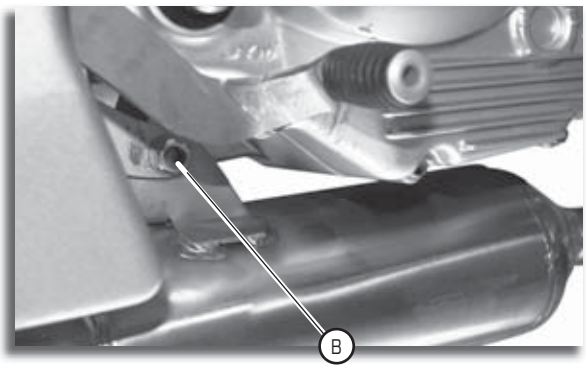
EXHAUST PIPE

REMOVAL

- Unscrew the 2 bolts (A).
- Remove the central nut (B) located at the bottom of the engine.
- Remove the pipe and the gasket.



WARNING
CHECK THAT THE EXHAUST PIPE IS COLD.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

CHASSIS

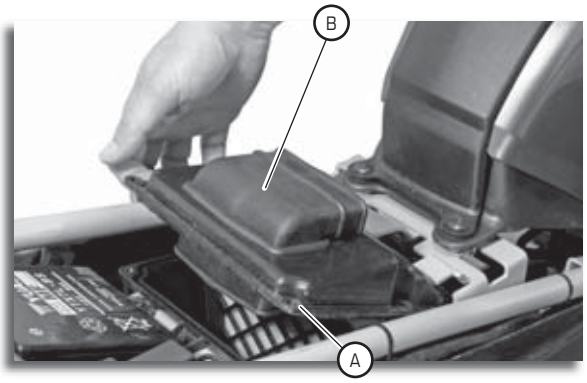
Phillips screwdriver

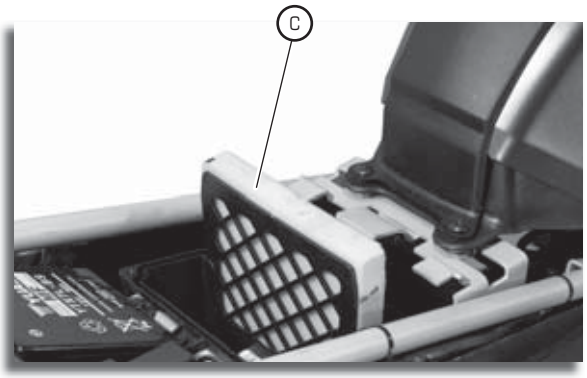
AIR FILTER

REMOVAL

- Remove the seat **(see section).**
- Remove the 6 bolts (A) securing the filter cover.
- Remove the cover (B) by pulling upwards.
- Remove the filter (C) by pulling upwards.

- Check that the filter is soaked in oil.





ASSEMBLY

- To assemble, carry out the operations in reverse order.

Set spanner

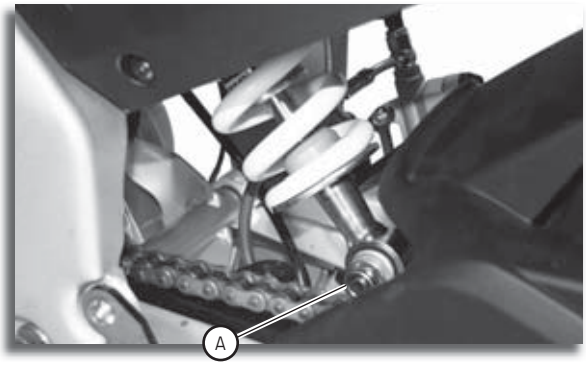
Allen key

SHOCK ABSORBER

REMOVAL

- Remove the seat **(see section).**
- Remove the tank **(see section).**
- Remove the 2 bolts and the 2 securing nuts (A).
- Remove the shock absorber.

N.B
REMEMBER THE POSITION OF THE SHOCK ABSORBER FOR SUBSEQUENT REFITTING.



ASSEMBLY

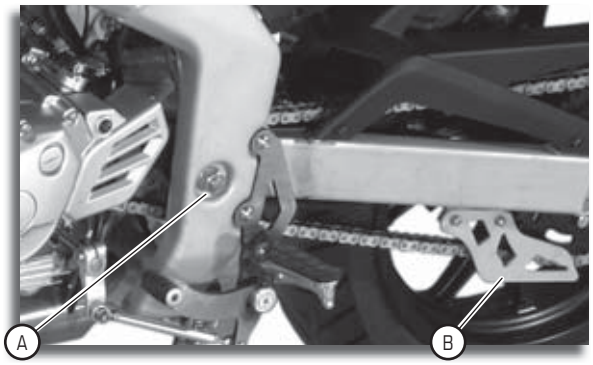
- To assemble, carry out the operations in reverse order.

4 CHASSIS

Set spanner

SWINGING ARM

REMOVAL



- Remove the chain protector **(see section).**
- Remove the chain **(see section).**
- Remove the rear wheel **(see section).**
- Remove the shock absorber (the bottom part) **(see section).**
- Remove the rear brake cable clamp located at the bottom of the swinging arm.
- Remove the trim (B).
- Remove chain roller.

- Unscrew the nut (A) on both sides.
- Remove the swinging arm shaft.
- Remove the swinging arm.

CAUTION
-PLACE THE MACHINE ON A FLAT SURFACE.
-STAND THE MACHINE ON A SUITABLE SUPPORT, IN SUCH A WAY THAT THE REAR WHEEL IS OFF THE GROUND.

ASSEMBLY

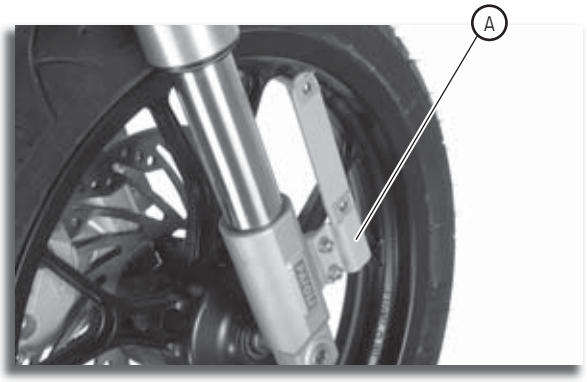
- To assemble, carry out the operations in reverse order.

Allen key

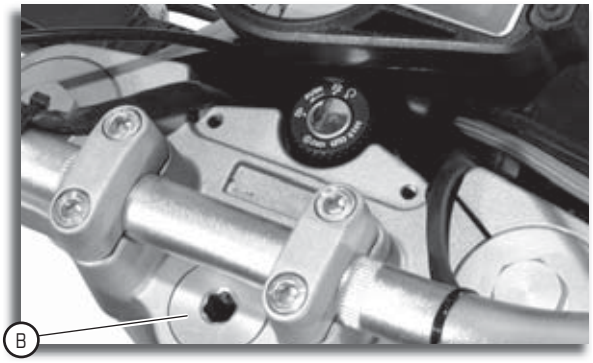
FORKS

REMOVAL

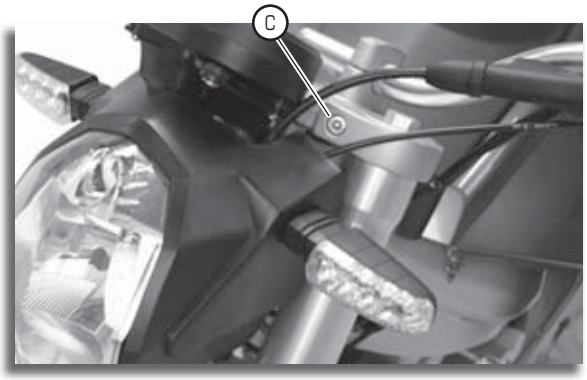
- Remove the handlebars **(see section).**
- Remove the front wheel **(see section).**
- Remove the headlight **(see section).**
- Remove the instrument panel **(see section).**
- Remove the ignition switch **(see section).**



- Remove the front mudguards **(see section).**
- Remove the mudguard brackets (A).
- Remove the nut and washer (B).
- Loosen the 2 bolts (C) from the top plate.
- Remove the fork tubes from the bottom.
- Remove the top plate



CAUTION
-PLACE THE MACHINE ON A FLAT SURFACE.
-STAND THE MACHINE ON A SUITABLE SUPPORT, IN SUCH A WAY THAT THE FRONT WHEEL IS OFF THE GROUND.

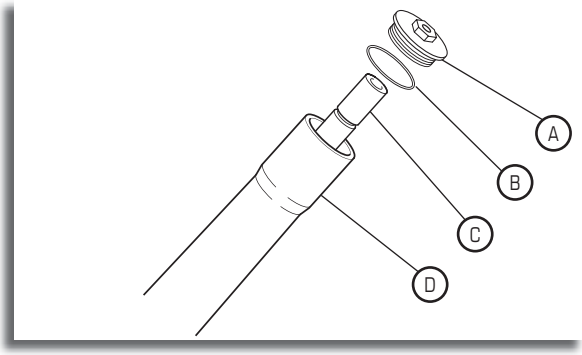


ASSEMBLY

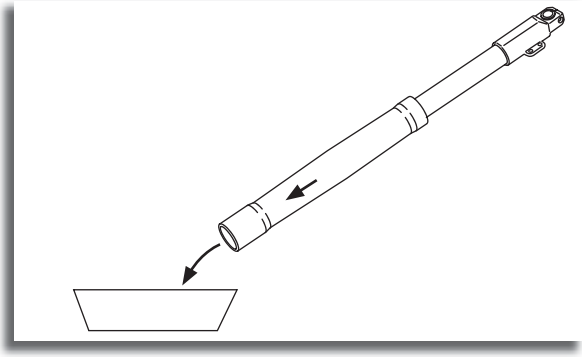
- To assemble, carry out the operations in reverse order.

4 CHASSIS

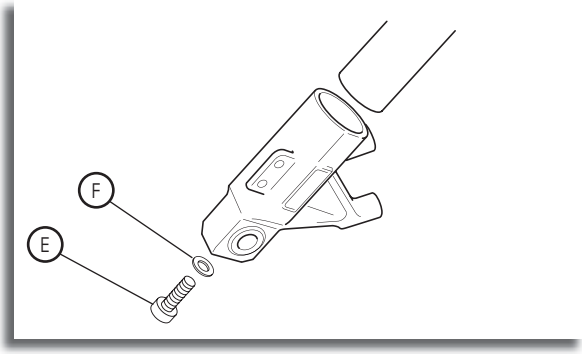
- Unscrew the plug (A).
- Remove the O-ring (B), the spacer (C) and the spring (D).



- Drain the hydraulic fluid into a container.

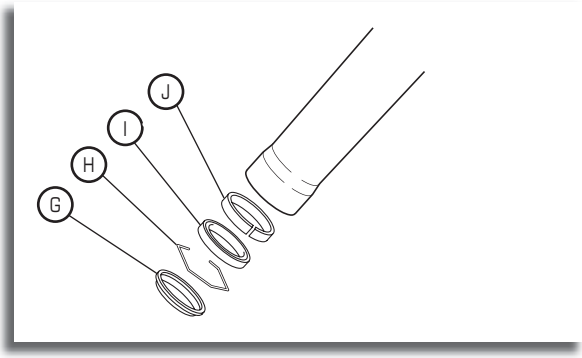


- Unscrew the bolt (E) and the seal (F).



- Remove the dust guard (G), the locking ring (H), the airtight seal (I) and the ring (J).

- Hydraulic fluid:
  TYPE: SAE 15



Set spanner

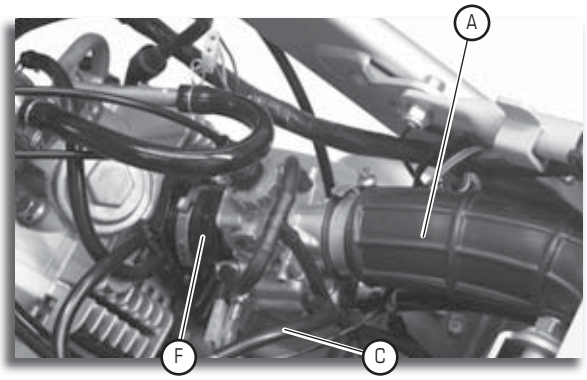
CARBURETTOR

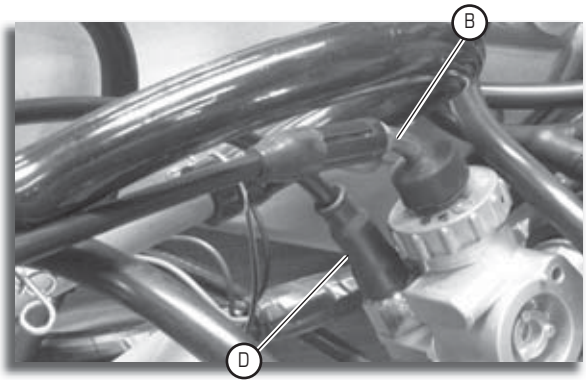
REMOVAL

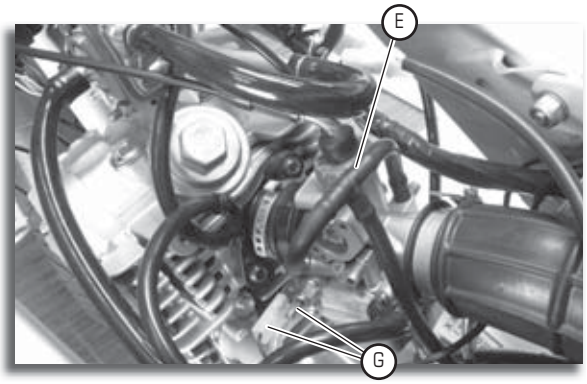
- Remove the seat **(see section).**
- Remove the fuel tank **(see section).**

- Disconnect the carburettor air intake (A).
- Disconnect the throttle cable (B).
- Disconnect the fuel intake (C).
- Disconnect the choke cable (D).
- Disconnect the gas outlet pipe (E).
- Disconnect the inlet manifold (F).
- Disconnect the cables (G).

- Remove the carburettor.







ASSEMBLY

- To assemble, carry out the operations in reverse order.

5 ELECTRICAL SYSTEM

CONTENTS

FRONT HEADLIGHT – MAIN BEAM/DIPPED BEAM BULB 53
FRONT HEADLIGHT - SIDELIGHT 54
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INSTRUMENT PANEL 61

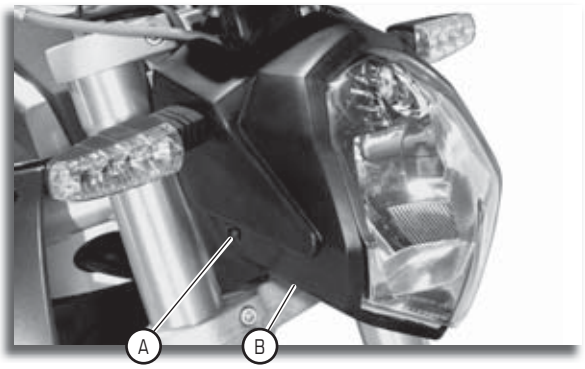
5 ELECTRICAL SYSTEM

Allen key

FRONT HEADLIGHT
MAIN BEAM/DIPPED BEAM BULB

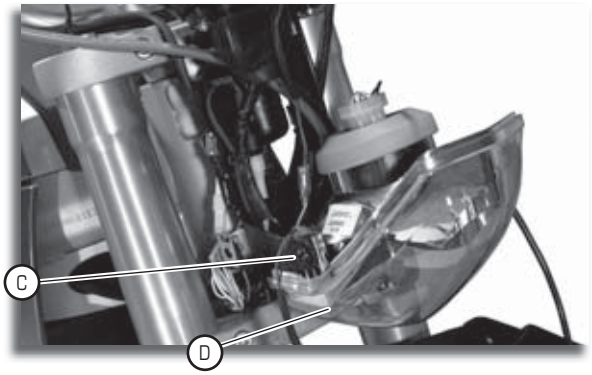
• Remove the two bolts (A), one on each side, securing the headlight housing (B).

• Tilt the headlight housing (B) downwards to be able to access the headlight.



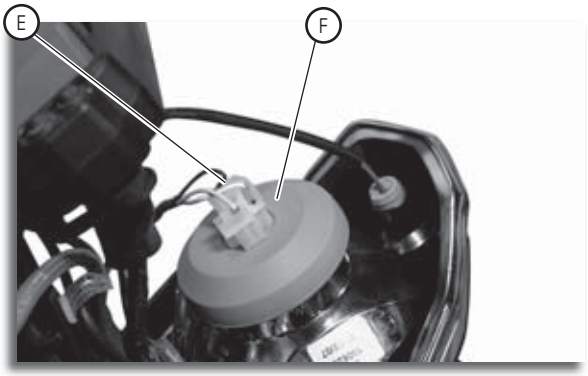
• Loosen the two bolts (C), one on each side, securing the headlight to the chassis.

• Tilt the headlight (D) forwards to make working easier.



• Remove the bulb connector (E).

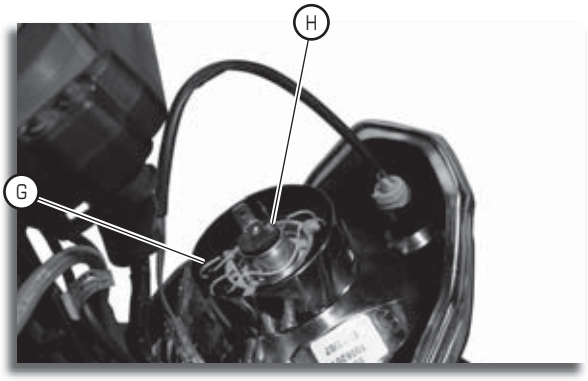
• Then remove the dust guard (F) covering the bulb.



To remove the bulb:

• Press the securing clips (G).

• Remove the bulb (H).

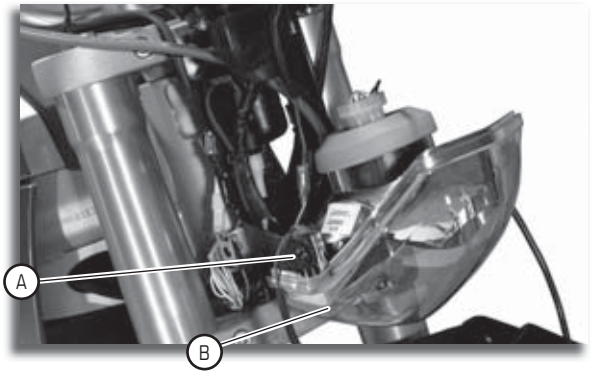


ASSEMBLY

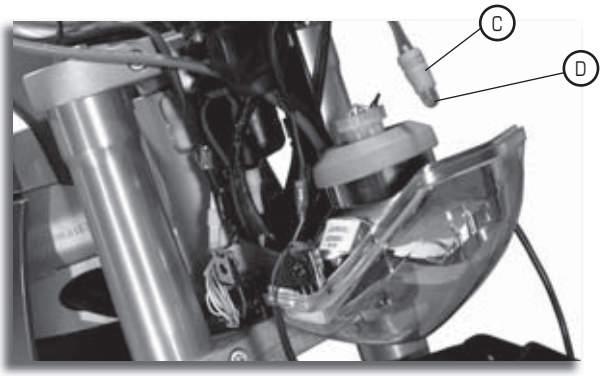
• To assemble, carry out the operations in reverse order.

Allen key

FRONT HEADLIGHT - SIDELIGHT



- Remove the front headlight main beam/dipped beam bulb **(see section).**
- Loosen the two bolts (A) securing the headlight.
- Tilt the headlight (B) forwards.



- Pull down the headlight housing (C) to extract the headlight.
- Then pull out the bulb (D) while holding the headlight housing with the other hand.

ASSEMBLY

- To assemble, carry out the operations in reverse order.

WARNING
KEEP THE SWITCH DISCONNECTED DURING THIS OPERATION.

CAUTION
FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR FITTING THE BULB.

5 ELECTRICAL SYSTEM

Set spanner

REAR LIGHT

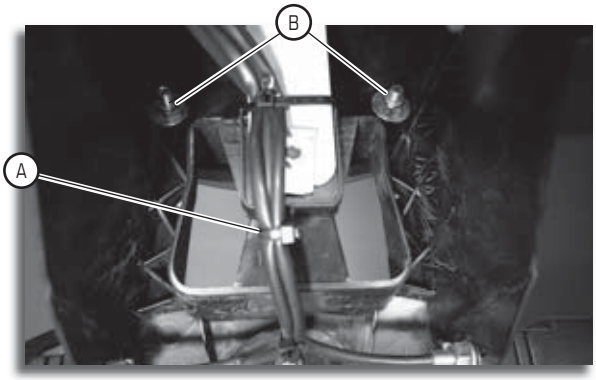
REMOVAL

To replace the rear light, these operations must be carried out by way of the step for the rear wheel:

• Disconnect the light from the wiring (A).

• Hold the light with one hand.

• Remove the two nuts (B) securing the light to the number plate bracket.



ASSEMBLY

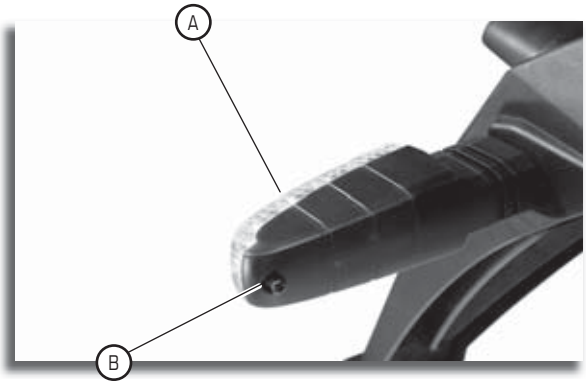
• To assemble, carry out the operations in reverse order.

Phillips screwdriver

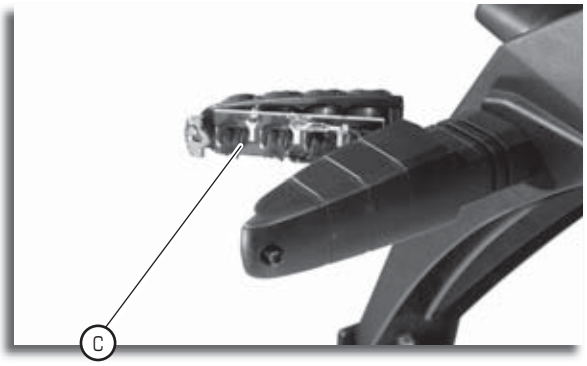
FRONT AND REAR TURN INDICATOR LIGHTS

REMOVAL

- Loosen the bolt (A) holding the screen.
- Remove the screen (B).



- Turn the bulb (C) to the left and remove it.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

WARNING
KEEP THE SWITCH DISCONNECTED DURING THIS OPERATION.

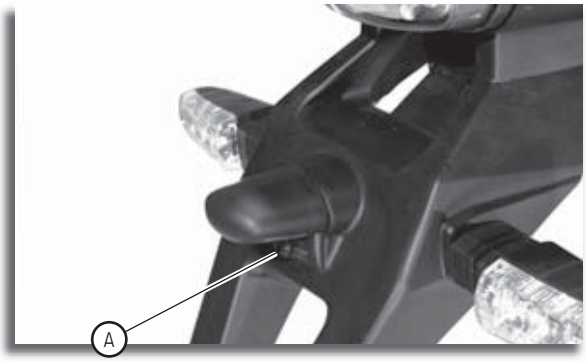
5 ELECTRICAL SYSTEM

Allen key

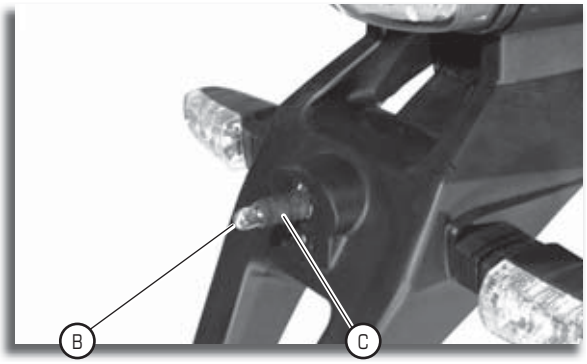
NUMBER PLATE LIGHT

REMOVAL

- Remove the bolt (A) holding the screen.



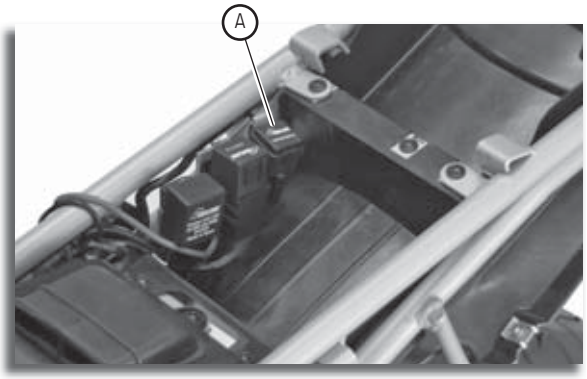
- Then pull out the bulb (B) while holding the bulb holder (C) with the other hand.



ASSEMBLY

- To assemble, carry out the operations in reverse order.

RELAY



REMOVAL

- Remove the seat **(see section).**
- Disconnect the relay (A).

ASSEMBLY

- To assemble, carry out the operations in reverse order.

E.C.U.

REMOVAL

- Remove the seat **(see section).**
- Remove the fuel tank **(see section).**
- Disconnect the ECU (A).

ASSEMBLY

- To assemble, carry out the operations in reverse order.

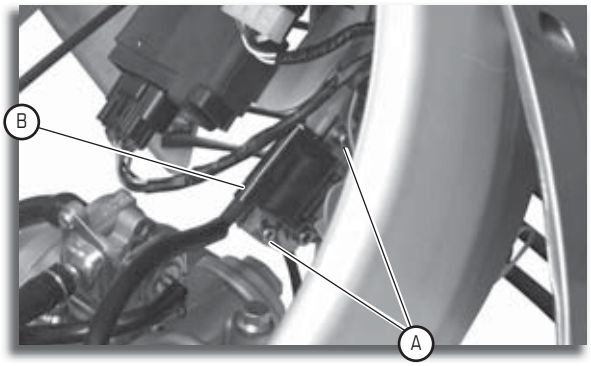
5 ELECTRICAL SYSTEM

COIL

REMOVAL

- Remove the seat **(see section).**
- Remove the fuel tank **(see section).**

- Remove the 2 bolts (A).
- Remove the coil (B).



ASSEMBLY

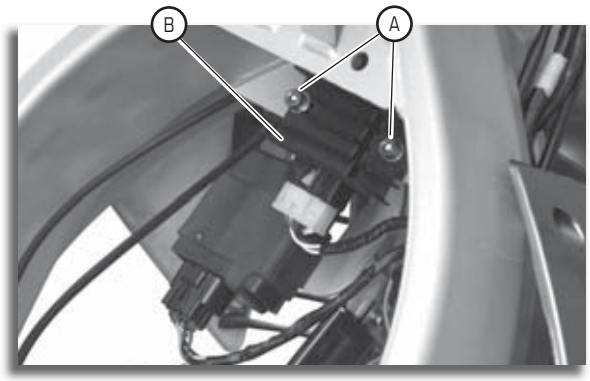
- To assemble, carry out the operations in reverse order.

REGULATOR

REMOVAL

- Remove the seat **(see section).**
- Remove the fuel tank **(see section).**

- Remove the 2 bolts (A).
- Remove the regulator (B).



ASSEMBLY

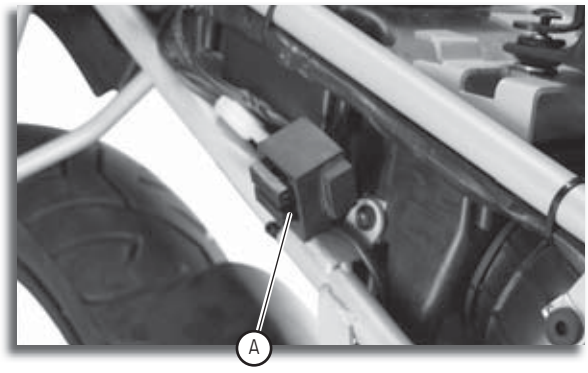
- To assemble, carry out the operations in reverse order.

FUSE

REMOVAL

- Remove the seat **(see section).**
- Remove the pillion passenger seat **(see section).**
- Remove the rear right-hand cowling **(see section).**
- Remove the right-hand central cover **(see section).**

- Disconnect and remove the fuse.



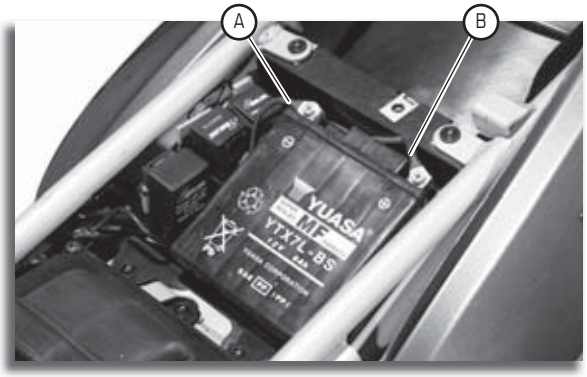
ASSEMBLY

- To assemble, carry out the operations in reverse order.

5 ELECTRICAL SYSTEM

BATTERY

REMOVAL



- Remove the seat **(see section).**

- Disconnect the two connecting cables. Negative (A) Positive (B).

ASSEMBLY

- To assemble, carry out the operations in reverse order.

WARNING
TO FIT A NEW BATTERY, REVIEW THE SECTION "PREPARING THE BATTERY" ON PAGE 19.

WARNING
TAKE THE BATTERY TO YOUR DEALER, SO THAT THEY CAN RECYCLE IT.

CAUTION
IF YOU RENEW THE BATTERY, ENSURE THAT THE NEW ONE DOES NOT EXCEED 12V AND 6AH.

5 ELECTRICAL SYSTEM

DASHBOARD CONFIGURATION OR ADJUSTMENT

• The instrument panel has two adjustment buttons:

SET(1) button and MODE(2) button.

• Aim of the buttons is:

Allow functions scrolling.

Regulation of the clock.

Set to zero the TD, AVE , LAP and MAX values.

Entering the Set-up menu to modify the wheel circumference value, the measurement unit value of distance, the number of impulses for every turn of the wheel and of the engine, and finally to associate the graphic bar to the selected information.

The function scrolling is always possible (it means the passage from one function to the following one) with the vehicle stopped or not. To update the instrumentation with the new function, it's enough briefly pushing the button (tmin = 1 sec.), when it will be left the display will show the new function.
The setting to zero of TD, of the chronometer, of the average and max. speed can be done both with the vehicle stopped or in movement as described in the previous paragraphs. Clock regulation is possible only when vehicle is stopped.

The entering in the Set-up menu is possible only when the vehicle is stopped by pushing at the same time the two buttons for about 4 seconds; the back-up of all data will be done only when the Mode and Set buttons (it depends on selected set up chosen) will allow the exit from the Set-up menu.

5 ELECTRICAL SYSTEM

ATTENTION
BEFORE GOING ON PLEASE CAREFULLY READ ELECTRICAL FEATURES AT PARAGRAPH 14 VERIFYING THE FUNCTIONAL VOLTAGES FOR OPERATION OF THE SPEEDOMETER

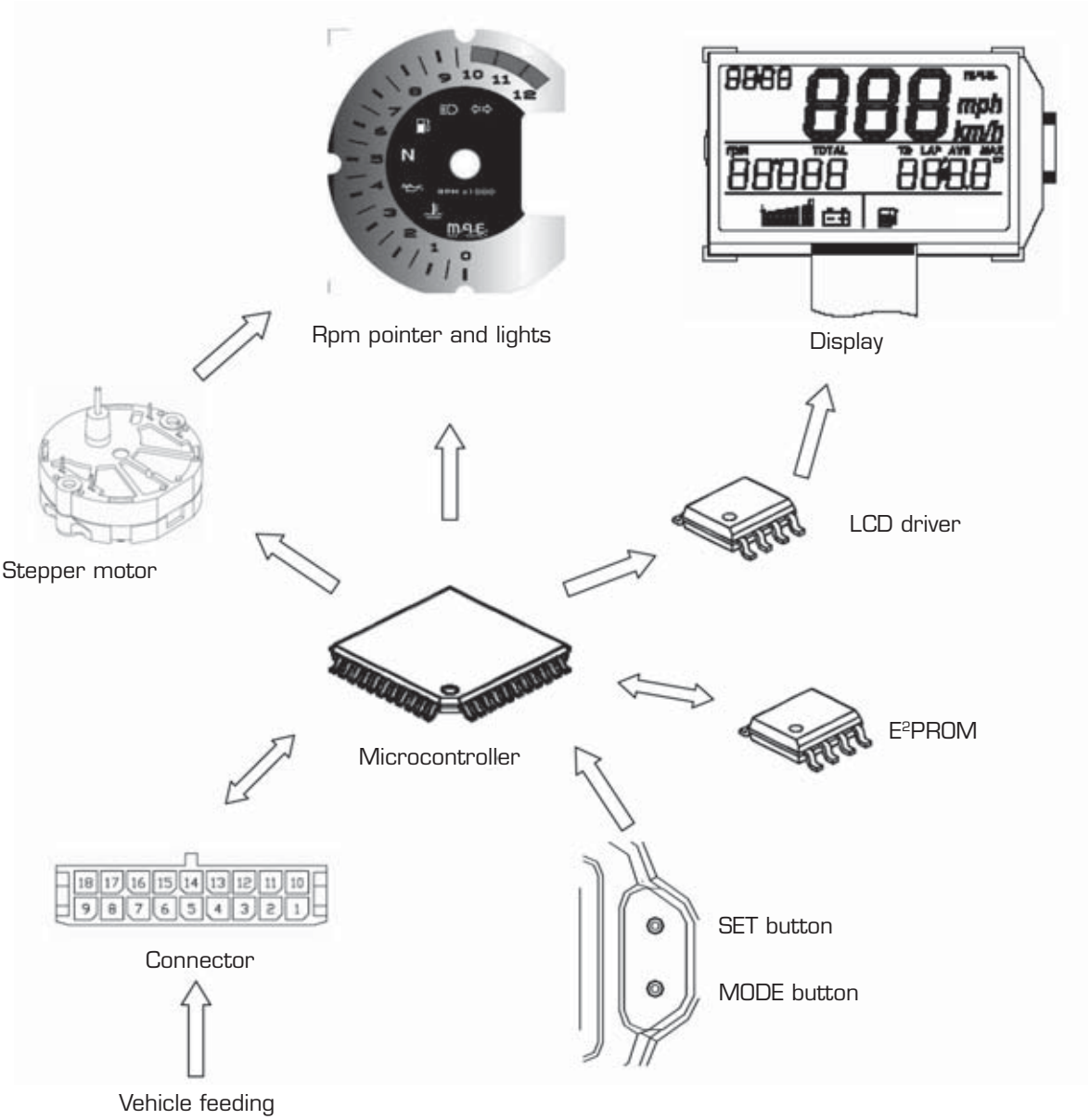
1. AIM

This document constitutes the technical manual with functional specifications for MHRN speedometer.

2. REFERENCES

M.A.E. electronic devices' general contract.

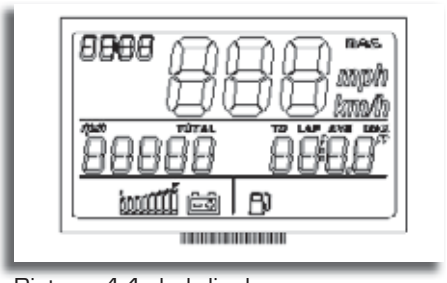
3. SYSTEM GENERAL DESCRIPTION



5 ELECTRICAL SYSTEM

4. COMPONENTS DEFINITION

4.1. LCD Display



Picture 4-1: lcd display

4.2. Mode and Set buttons

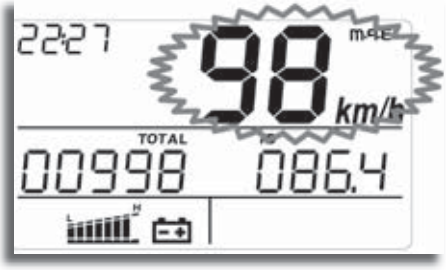
The device has got two buttons normally OPEN that close on a NEGATIVE.
Button 1: MODE
Button 2: SET
Functions and use of buttons is described in following paragraphs of the technical manual.

5. FUNCTIONAL CHARACTERISTICS

5.1. Instant speed function

The information is always visualized on digits 5÷7, see picture 5-1.

If measurement unit is km/h (default value) the corresponding digit is visualized; if You push the button and entering the Set-Up it is possible to select mph unit of measurement (pic.5-2).



Picture 5-1: Speed indication Km/h

The system has got following parameters:

Wheel Circ. [mm]	Pulses / lap	Max speed	Overspeed	Resolution
Selected by end user Min. 1.000 - Max 2.500	Selected by end user Min. 1 - Max 12	200 km/h (124 mph)	6% constant all over the scale	1 km/h (1 mph)

5.2. Totalizer function (TOTAL)

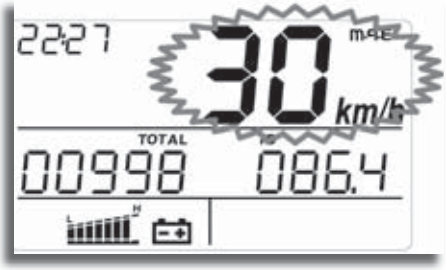
The information is visualized on digit 8÷12 and accompanied by TOTAL logo, as shown in pic 5-3.

The data is permanently memorized in a non volatile memory (E2prom refresh every km).

If the memory is empty You'll see numbers 00000 visualised.

This information is always calculated in km. Anyway it must be expressed in km or mph. You can select the chosen information by entering the Set-Up menu.

During normal using of the instrumentation it is not possible to set the information to zero.



Picture 5-2: Speed indication mph

Picture 5-3: Total covered distance

5.3. Trip function (TD)

Picture 5-4: Partial covered distance

This function describes the correct working/visualization of the board automatic partial totalizer.
This function is always represented on digit 13÷16 and by logo TD (pic.5-4).

The visualized data represents the vehicle covered distance expressed in miles or km (depending on the selected measurement unit), with resolution 0.1 (miles or km).

This counter is automatic: in fact it automatically starts with the first pulse arriving from speed sensor.

The data isn't memorized in a permanent mode.
It is possible setting the counter of this parameter to zero by pushing the **Set** button for about 03 sec. (in correspondence of the TD function) till the value 000.0 appears.

It is possible setting to zero the TD function both when the vehicle is stopped and when it is running, this causes also the setting to zero of LAP and AVE functions.

If the data gets over 999.9 the system automatically sets to zero TD, LAP and AVE functions and then starts again the counting.

Obs.5-1: So: If there is no feeding the TD value is hopeless lost.

5.4. Time Function (TIME)

This function describes the correct working/visualization of the current hour. This function is always shown in the format hh:mm, by using digit 1÷4 (pic.5-5).
Clock is active also when the microcontroller is in sleep mode phase and regulation of the hour can be done only when the vehicle **is stopped**.

This information is not saved in the memory.

Visualized Series:
from 0:00 to 23:59 for method 0-24
from 0:00 to 12:59 for method 0-12 am
from 1:00 to 11:59 for method 0-12 pm

Clock precision: ±2.5 sec/day

Picture 5-5: clock

Obs. 5-2: If there is no feeding the TIME value is hopeless lost.

5 ELECTRICAL SYSTEM

Clock regulation can be done by pushing **Mode** button until when only segments related to TIME function are active (about 5sec.), while all the others are off (see picture 5-6).

Picture 5-6: clock regulation

It's possible to modify in series: first the hours then the minutes, this depends by the selected data (that will be shown blinking with f=1Hz, Duty=50%).

By pushing the Set button the selected parameter will add one unit, while by pushing the **Mode** button it will be possible to select the chosen parameter (minutes or hours) and to exit from regulation phase.

Time parameter will be shown in 0-24 format if unit of measurement chosen is km/h, while it will be shown in 0-12 format if unit of measurement is mph.
In this case on the display You will see on 5 and 6 digits the logo "AM" or "PM" during regulation phase, see picture 5-7.

Picture 5-7: clock regulation format 0-12

Obs. 5-3: Entered the regulation menu, if no buttons have been pushed, the system will automatically return to standard method of operation (saving possible modifications).

Obs. 5-4: Entered the regulation menu, if the vehicle starts (speed>0), the system will automatically return to standard method of operation (saving possible modifications).

5.5. Automatic Chronometer Function (LAP)

This function describes the correct working/visualization of the chronometer related to TD and AVE.
This information is visualized by using digit 13÷16 and logo LAP.

The data represents the effective route time of the vehicle in the form mm:ss if hours = 0 (pic.5-8) and in the form hh:mm if hours > 0 (pic.5-9).

Picture 5-8: lap in format mm:ss

It is automatically activated by the first pulse coming from the speed sensor and it stops after 3 seconds from receiving of the last pulse which arrives from the speed sensor.

If hours >0, when LAP is operative, the digit that separates the hours from the minutes is shown blinking, while it is shown fixed when LAP is not operative

If hours = 0, when LAP is operative, the digit (‘ and “) that separates the minutes from the seconds is shown blinking, while it is shown fixed when LAP is not operative.

Picture 5-9: lap in format hh:mm

The data **isn’t** memorized in a permanent mode.

It is possible to set to zero the counter of this parameter by pushing the **Set** button for about 2 seconds, in correspondence of the function LAP till when the value 00’00”appears.

The setting to zero of LAP, which is possible both when the vehicle is stopped or when the vehicle is running, produces the setting to zero of TD and AVE too.

If the data gets over the value 23-59 (which means 23h59’59”), the system provides to set to zero LAP, TD and AVE, then it starts again the counting.

> **Obs. 5-5:** If there is no feeding the LAP value is hopeless lost.

5.6. Average speed function (AVE)

This function describes the correct working/visualization of average speed function related to TD and LAP.
The information is visualized by using digit 13÷16 and logo AVE (pic.5-10).
The data represents the average speed of the vehicle (expressed in Km/h or in Mph depending on the selected measurement unit) that is calculated as ratio between covered distance (TD) and the time used to cover this distance (LAP).

The average speed is updated every 0,1 Km (or 0,1 Miles, depending by measurement unit selected).

5 ELECTRICAL SYSTEM

The data isn't memorized in a permanent mode.

It's possible to set to zero the counter of this parameter pushing the **Set** button for about 2 seconds, in correspondence of the function AVE, till when the value 0.0 appears.

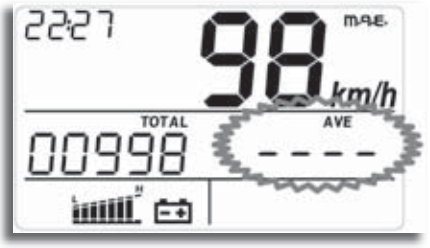
The setting to zero of AVE, which is possible both when the vehicle is stopped or when the vehicle is running produces the setting to zero of TD and LAP too.

AVE setting to zero is foreseen when LAP function arrives to 23:59:59 value or when TD function rises 999.9 value.

If the data is out of range , it will be visualized - - - -, as shown in picture 5-11

Obs. 5-6: If there is no feeding the AVE value is hopeless lost.

Picture 5-10: Average speed indication



Picture 5-11: average speed out of range

5.7. Max. speed function (MAX)

This function describes the correct working/visualization of maximum speed function.
The information is visualized by using digit 14 16 and logo MAX (pic.5-11).

The parameter identifies the maximum speed achieved by the vehicle, expressed in km/h or mph depending on the selected unit of measurement.

It's possible to set to zero the counter related to this parameter, in correspondence of MAX function, by pushing **Set** button till value 00 appears.

The setting to zero of MAX function is possible both when the vehicle is running or stopped.

Changing measurement unit, will cause conversion of MAX value.

The data isn't memorized in a permanent mode.

Obs. 5-7: If there is no feeding the MAX value is hopeless lost.

Picture 5-11: Maximum Speed

5.8. Battery charge level function

The information is visualized on the bottom left part by using the graphic bar, accompanied by
the battery symbol ignition, as shown in picture 5-12.

Picture 5-12: battery level

The graphic bar, updated every 0,5 seconds, is managed by the following table:

Voltage [V]	Active segments
Till 9,49V	1
From 9,50V to 9,99V	2
From 10,00V to 10,49V	3
From 10,50V to 10,99V	4
From 11,00V to 11,49V	5
From 11,50V to 11,99V	6
From 12,00V to 12,49V	7
Over 12,50V	8

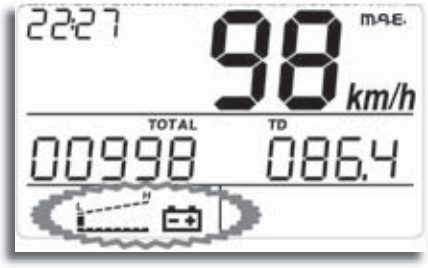
5.9. RPM

The value of rpm is shown by the analogic quadrant.
Overboost: between 10.000 and 12.000 rpm.
The number of rpm pulses are settable between 1 and 8.

6. ALARMS MANAGEMENT

6.1. Battery voltage alarm

Every time that found out voltage value goes down 9,5V, the system starts alarm routine to signal the possibility that after switching ON of the vehicle, the speedometer can loose its settled data.



Picture 6-1: battery voltage alarm

The signal is the graphic bar visualization (regardless the current function), by blinking the first segment of the bar and battery symbol as shown in picture 6-1.

This indication does not change the operation of the speedometer, that normally continues its activity with the only difference that when there is this alarm the previous logo is shown.

When the voltage goes over 9,5V the alarm status turn off.

5 ELECTRICAL SYSTEM

6.2. Fuel Level Alarm

Every time that fuel level sensor closes on earth, the icon is visualized on the display (fuel reserve symbol) as shown in picture 6-2.

At the same time the microcontroller will turn on the related light on the dial (see paragraph 7.4).

The icon disappears and the light turned on when the sensor opens again the contact.

Picture 6-2: Fuel level alarm

7. BACKLIGHT AND INDICATORS LIGHTS FUNCTION

7.1. High Beam light

The system has to switch on the led when the input No.12 of the connector is high, at the same time of High Beam ignition.

7.2. Indicators lights function

The system has to switch on the led when the inputs No.2 or No.13 of the connector are high, at the same time of Indicators lights ignition.

N.B.
SIGNAL MUST ARRIVE TO THE DEVICE ALREADY ALTERNATE.

7.3. Neutral light function

The system has to switch on the led when the input No.6 of the connector is low, at the same
time of placing of gear lever in neutral position.

7.4. Fuel light function

The system has to switch on the led when the input No.15 of the connector is low, at the same time of minimum level of fuel tank.

7.5. Backlighting and dial lights function

LCD and dial backlight is orange and is always ON when the key is turned on.

8. SET-UP MENU

The entry in the set-up menu is only possible when the vehicle is stopped by pushing at the same time the **Mode** and the **Set** button for about 04 seconds regardless the visualized function.

On the display the "SET Par" logo will appear fixed (as in the picture 8-1) for the entry in the set-up menu of parameters.

Picture 8-1: parameters set-up menu

Obs.8-1: If the input #5 (settings) on the connector is connected to ground, it is possible to change every parameter.
If the input #5 (settings) on the connector is not connected to ground (default condition), it is only possible to change measurement unit.

8.1. Parameters SET-UP menu

This menu allows to modify the following parameters:

- Wheel circumference (min 1.000mm max 2.500mm) (factory)
- Number of pulses for every turn of the wheel (min 1 max 12) (factory)
- Number of pulses for every turn of the engine (min 1 max 8) (factory)
- Measurement unit of distance (km/h or mph) (factory + user)

To save the modifications in the memory, it is necessary that the set-up procedure is completed using the Mode button by keeping pressed the Mode button in correspondence of the measurement unit selected.

When the dashboard is in the set-up menu, if :

- Velocity becames >0
- The button is not pushed for 20 seconds.

The dashboard will exit from setup menu without saving any changes and will restore the previous values.

Only in the case in which the procedure of Set-Up is completed in a correct way, the system goes on with the saving in permanent memory of all the made selections.

5 ELECTRICAL SYSTEM

8.2. Modifications allowed to user (input #5 disconnected)

8.2.1. Distance unit measurement regulation

The display the symbols km/h and mph will be shown and the selected value will be shown first blinking (f=1Hz, Duty=50%) (picture 8-2).

Picture 8-2:distance unit misure regulation

Pressure on Set button causes the change in shown blinking unit, while the Mode button pressure, in correspondence of blinking unit, allows to select the same unit and the passage to following screen (or going out from regulation, depending on #5 input).

The information concerning the selected measurement unit is saved in memory.

Obs. 8-1: Changing measurement unit will cause the conversion of TOTAL and will set to 000.0 TD.

Obs. 8-2: Once inside the regulation menu:

- If 20 sec. will pass without the button mode is pushed, or
- If the vehicle is turned on (speed>0), or
- If the key is turned OFF

The system will be automatically taken to the stadard operating mode and the modifications possibly produced will be lost.

8.3. Modifications allowed to the factory (input #5 connected to gnd)

8.3.1. Wheel circumference modification

Picture 8-3: wheel circumference regulation

The display is introduced as shown in picture 8-3, where the information of wheel circumference is visualized on digit 13÷16, preceded by the letter “crf” on digit 10÷12.

It’s possible modifying the various digits which constitute the value of the wheel circumference, leaving from the most significant digit and moving in series towards the least significant digit.

Starting from the selected data (that will be shown blinking with f = 1 Hz, Duty = 50%), a short pressure of the Set button will allow an unitary increase, while a long pressure of Mode button will allow to select a different digit.

The selected circumference of the wheel is saved in memory.

Obs. 8-3: Regulation: from 1.000mm to 2.500mm with step of 1mm. Setting a value over 2.500mm, will cause the circumference set to default value (1.845mm)

Obs. 8-4: Once inside the regulation menu:

- If 20 sec. will pass without the button mode is pushed, or
- If the vehicle is turned on (speed>0), or
- If the key is turned OFF

The system will be automatically taken to the standard operating mode and the modifications possibly produced will be lost.

8.3.2. Modification wheel revolution impulses

This parameter expresses the number of impulses that the speed sensor sends to the instrumentation for every wheel revolution.

The selected value is shown blinking as in picture 8-4 (f=1Hz, Duty=50%).

Picture 8-4: wheel turns regulation

Pressure of Set button allows the unit increase impulses, from a minimum of 1 to a maximum of 12.

Pressure of Mode button allows the value confirmation and the passage to the following screen.

The information concerning the number of impulses which the instrumentation receives from the speed sensor is saved in memory.

Obs. 8-5: Impulses can also NOT have the same distance.

Obs. 8-6: Once inside the regulation menu:

- If 20 sec. will pass without the button mode is pushed, or
- If the vehicle is turned on (speed>0), or
- If the key is turned OFF

The system will be automatically taken to the standard operating mode and the modifications possibly produced will be lost

8.3.3. Modification engine revolution impulses

This parameter expresses the number of impulses that the vehicle sends to the instrumentation for every engine tree revolution.

The chosen value is shown blinking (with f=1Hz, Duty=50%).

Picture 8-5: engine turns regulation

Visualization on the display, picture 8-5, has "RPM" on digit 10÷12.

Pressure of Set button allows the unit increase of engine turns impulses, from a minimum of 1 to a maximum of 8.

Pressure of Mode button allows the value confirmation and the exit from Set-up menu.

5 ELECTRICAL SYSTEM

The information concerning the number of impulses of the engine is saved in memory.

Obs. 8-7: Once inside the regulation menu:

- If 20 sec. will pass without the button mode is pushed, or
- If the vehicle is turned on (speed>0), or
- if the key is turned OFF

The system will be automatically taken to the standard operating mode and the modifications possibly produced will be lost

8.3.4 Distance unit measurement regulation

See paragraph 8.2.1

8.4. Regulations sequence

Input #11 disconnected → MEASUREMENT UNIT

Input #11 connected to GND → WHEEL CIRCUMFERENCE → WHEEL REVOLUTION PULSES → ENGINE REVOLUTION PULSES → MEASUREMENT UNIT

9. MODE AND SET BUTTONS FUNCTION

Aim of the buttons is:

- Allow functions scrolling
- Regulation of the clock
- Set to zero the TD, AVE , LAP and MAX values.
- Entering the Set-up menu to modify the wheel circumference value, the measurement unit value of distance, the number of impulses for every turn of the wheel and of the engine, and finally to associate the graphic bar to the selected information.

The function scrolling is always possible (it means the passage from one function to the following one) with the vehicle stopped or not. To update the instrumentation with the new function, it's enough briefly pushing the button (tmin = 1 sec.), when it will be left the display will show the new function.
The setting to zero of TD, of the chronometer, of the average and max. speed can be done both with the vehicle stopped or in movement as described in the previous paragraphs.
Clock regulation is possible only when vehicle is stopped.

The entering in the Set-up menu is possible only when the vehicle is stopped by pushing at the same time the two buttons for about 4 seconds; the back-up of all data will be done only when the **Mode** and **Set** buttons (it depends on selected set up chosen) will allow the exit from the Set-up menu..

Key	Mode	Set	Speed	Function allowed
OFF	-	-	-	Buttons inhibited
ON	ON	OFF	>0	Scrolling
ON	OFF	ON	>0	Set to zero of selected function
ON	ON	ON	0	All functions are allowed

9.1. Sequence of represented functions

The function scrolling is always possible, with the vehicle stopped or not, by using the **Mode** button as follows:

Mode Button →

TD	LAP	AVE	MAX

TD — Partial covered distance
LAP — Time on turn
AVE — Average speed
MAX — Max speed

5 ELECTRICAL SYSTEM

10. START-UP

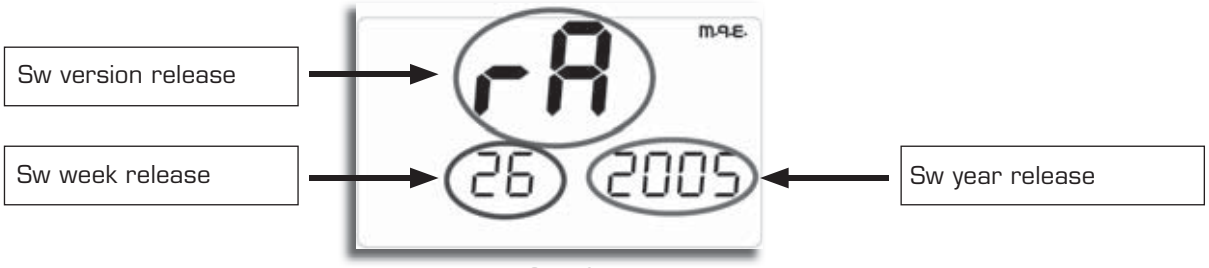
At the start-up (key from OFF to ON), the system gives to the user some information which
are shown in following screens (or pages):

• **First page**: visualization of the release date and software's version (for about 2 seconds).
This information is shown only during the first installation of the instrumentation (picture 10-1).

• **Second page:** display check. All the display segments are ON for about 2 seconds (picture 10-2).

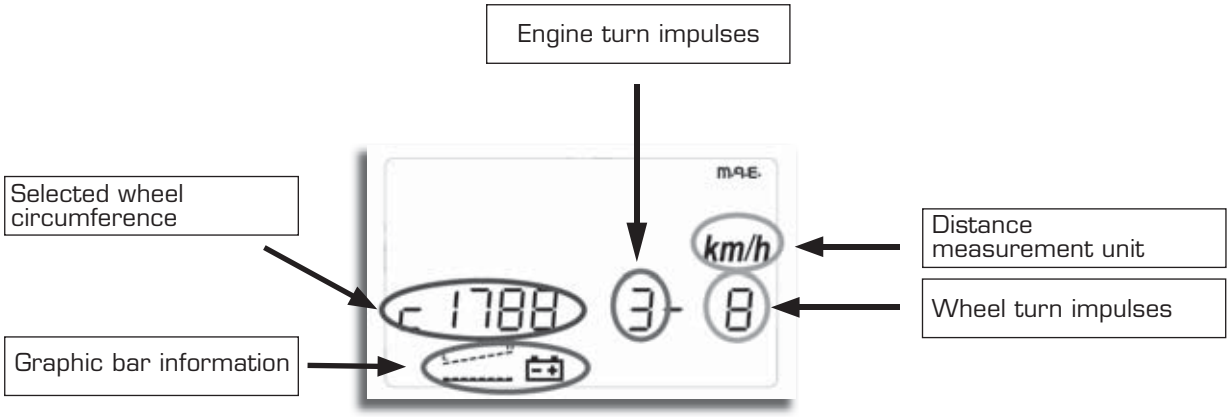
• **Third page:** visualization of the wheel circumference, of the measurement unit selected for the distance, of the impulses' number for every turn of the wheel and of the engine, visualization of symbols associated to graphic bars (picture 10-3).

• In correspondence of screens over described, the system start the lights' check backlighting check: all lights' led are active and at display check end they are off. After all the check, the system will show the normal visualization.



Picture 10-1: first page

Picture 10-2: second page



Picture 10-3: third page

Obs. 10-1: If during the Start up phase the vehicle starts (speed>0), the instrumentation will interrupt the check and will return to the standard operation mode.

Obs. 10-2: If during the Start up phase the key will be turned off, the instrumentation will interrupt the check and will return to sleep mode.

5 ELECTRICAL SYSTEM

11. SLEEP-MODE AND WAKE-UP

11.1. Sleep mode

The microcontroller enters the **sleep-mode** phase, with low current absorption, when the key is turned off.

To reach this aim, during sleep mode phase, every activity will be interrupted, the display and its backlighting will be off, only the update of current hour is on Sleep-mode phase can always be reached, regardless from selected function.

11.2. Wake-Up

Awakening from **Sleep** mode phase occurs when the key is turned ON.

Immediately after the microcontroller awakening following activities happen:

- Check of the display and of lights for about 2 seconds.
- Visualization of selected wheel circumference, of wheel turns impulses, of unit of measurement and of graphic bars for about 2 seconds (see picture 10-3).
- Starting of last visualized function before sleep mode status and qualification of all functions.

12. FIRST INSTALLATION OF DEVICE

Default values of the device:

- Circumference: 1.845mm
- Measurement unit of distance: km/h for speed and km for distance
- Turn wheel/impulses: 6
- Turn engine/impulses: 4

To modify one of these parameters You have to follow the procedure as in Set-up menu paragraph. During first installation of device the display always shows the updated software version and date.

13. TEST MENU

ATTENTION
USING OF TEST PROCEDURE NEEDS ONLY QUALIFIED STAFF.
TO AVOID EVERY KIND OF DRAWBACKS OR BAD FUNCTIONING PLEASE

DO NOT USE
Foreseen menu function and do not disclose the content of this chapter to final end user.

Entry in test menu is allowed only during installation phase of device on the vehicle, by placing at earth the test wire #5 (usually without cable) and keeping pushed Mode and Set button together.
In these conditions the system will place itself on Test menu and following operations will be possible:

- Operator check of the device (COLL_MAN)
- Check of the device by using an automatic and optical test system (television camera COLL_AUTO)
- Erasing of the E2prom (E2PROM)
- Calibrating pointer position on the dial (IND)

To well operate inside the Test Menu some inputs of the speedometer are set up again as follows:

Input	Function
Fuel	Up button
Wtemp	Md button
Oil	Down button

13.1. Manual Test procedure (COLL_MAN)

This is a procedure very useful for an operator to briefly check in a safe way the instrumentation's input and the pointer's movement.

To enter the procedure the Md button must be pressed inside the correspondent screen in Test Menu (by using **Up** and **Down** buttons the selection will occur) (pic. -1)

Picture 13-1: entering manual test

5 ELECTRICAL SYSTEM

Now the system starts the display check by lighting all segments in series; at the end of the check screen in picture 5-2 will be visualized, the total distance covered from the vehicle appears
(unit of measurement km).

• Every time **Mode** button is pressed the system starts pointer's check, that follows the movement of all the route foreseen on the dial (from zero to end of the scale) and return.

• By using **Up** button it is possible to turn on all the indicators lights and backlighting (only of the dial because display backlighting is always on).

• By using **Down** button it is possible to turn off all indicators lights and backlighting (only of the dial because display backlighting is always on).

In this function is also possible to show the velocity (without improving TOTAL or TD).

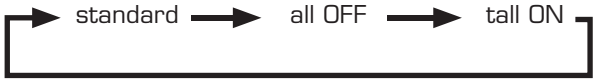
By using **Md** button it is possible to exit from Manual Test and come back to Test Menu

13.2. Automatic test procedure (COLL_AUTO)

It's an useful procedure to verify the instrumentation through an automatic equipment. To enter the procedure **Md** button must be pressed inside the correspondent screen in Test menu (by using **Up** and **Down** buttons the selection will occur, pic.13-2).

Now the system will show the standard screen (except for the battery charge graphic bar).

By pushing the **Mode** button it is possible to change the screen as described:



For 10 times consecutively before returning to the test menu.

During the succession of the screening it is possible:

• Turning on all the indicators lights and the backlight by pushing **Up** button.
• Turning off all the indicators lights and the backlight by pushing Down button.
• Viewing the velocity (without increasing the kilometers) arriving from the SENS IN (#10).
• Moving the pointer (only during standard screen – turn off the RPM signal before changing screen). Due to this, RPM (#8) is set up so that the system determine the shifting of the pointer of an equal number of steps to the incoming number of impluses.
The direction of the shifting is determined by the Set button: button which is not pressed shows an clock direction, while pressed button determines a direction of shifting of the index in anticlockwise direction.

Picture 13-2: entering automatic test

N.B.4
NB: RPM AND SPEED MUST NOT BE ACTIVE AT THE SAME TIME

13.3. Erasing procedure E²prom (E²PROM)

During the tests and the controls of the instrumentation, it's useful erasing the E2prom memory.

To enter the procedure the **Md** button must be pressed inside the correspondent screen in Test Menu (by using **Up** and **Down** buttons the selection will occur, pic. 13-3).

Now the display shows a warning message (Reset shown blinking, picture 13-4): **this operation IS IRREVERSIBLE and deleted data can't be recovered.**

By using **Up** or **Down** button it is possible to fail this operation and come back to Test menu.

By using **Md** button it is possible to go on with the operation and completely erase the whole memory.

A confirmation message (fixed logo Reset) will remember the operator the possible need to make pointer calibration.

The return to Test menu will be possible by using whatever of the three buttons (**Up**, **Md** or **Down**).

Picture 13-3: entering E²prom erasing

Picture 13-4: Erasing procedure warning

13.4. Pointer's procedure of calibration (IND.)

The calibration is useful to correct eventual mistakes of position made during the phase of setting out of the pointer.
To enter this procedure the Md button must be pressed inside the correspondent screen in Test menu (by using **Up** and **Down** buttons the selection will occur, pic. 13-5).

Now the display will ask to the operator to put in micro step numbers necessary to allow the pointer to reach the zero on silk-screen printing.

By using **Up** button it is possible to start movement of the pointer in clockwise direction.
By using the **Down** button it is possible to start movement of the pointer in anticlockwise direction.

By using **Md** button it is possible to exit from Automatic test procedure and come back to previous

The selected value will be saved in a permanent memory.

Picture 13-5: Entering pointer calibration

5 ELECTRICAL SYSTEM

14. ELECTRICAL FEATURES

Maximum working features:

Param. No.	Feature	Simb.	Mln.	Max.	Units
PM1	Max working voltage	V_{MAX}	↓	17	V
PM2	Storage Temperature	T_{Sto}	-20	-85	°C
PM3	Max supplied current from pin 7	I_{Hall}		20	mA
PM4	Max current applicable to inputs	I_{InMax}	↓	20	mA
PM5	Max current applicable to outputs	I_{outMax}	↓	20	mA

Normal working features:

Param. No.	Feature	Simb.	Mln.	Typ.	Max.	Units
P01	Supply voltage	V_{DD}	7	12	16	V
P02	Operative Temperature	T_{Op}	-20	↓	+80	°C
P03	Current absorption during On with all the light switched on (Vbatt=13,0V)	I_{on}	↓	tbd	tbd	mA
P04	Current absorption during On with all the light switched off (Vbatt=13,0V)	I_{on_spie}	↓	tbd	tbd	mA
P05	Current absorption during Sleep (Vbatt=13,0V)	I_{slp}	↓	tbd	tbd	mA

Tbd= to be determined

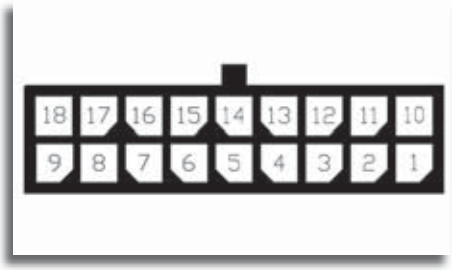
15. CONNECTOR PINOUT CONFIGURATION

The connector is directly placed on the bottom side of the board.

Producer MOLEX
Part Number 43045-1818

#	Meaning
1	------ Not connected
2	Left Indicator
3	------ Not connected
4	------ Not connected
5	------ Not connected Settings (if connetcetd to gnd)
6	Neutral
7	Vcc Sensor
8	RPM
9	Positive battery

#	Meaning
10	Sensor input
11	------ Not connected
12	High Beam lights
13	Right Indicator
14	GND
15	Fuel
16	------ ------ Not connected
17	P15
18	GND



Male figure – Female insertion side.

6 ENGINE

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6 ENGINE

CHARACTERISTICS

ENGINE

Type	4-stroke single-cylinder
Cooling	By natural air circulation
Bore x stroke	54 x 54 mm
Cubic capacity	123.7 cc
Distribution	By chain Single overhead camshaft, 2 valves
Clutch	Oil bath multi-disc clutch with manual control (4 smooth discs, 5 lining discs)
Gearbox	5 speed
Fuel supply	Carburettor Mikuni VM20
Lubrication	Trochoidal pump
Spark plug	CR7HSA
Starter motor	Electric 400 W
Exhaust	Non-catalytic

CAPACITIES

Engine oil	1 L 10W30

ENGINE MARKING. AR

Engine type	E336E

SPECIAL IMPORTANT POINTS

OIL AND FUEL

This engine is designed to run on 95 or 98 unleaded fuel only.

Fuel pipes must absolutely be changed if there are any wear marks, cracks, etc.

If they have to be changed, install genuine pipes.

Petrol is highly inflammable, do not smoke in the working area and avoid proximity to flames or sparks. Work in a clear and well-ventilated area.

Before carrying out any work, leave the engine to cool for at least 2 hours.

6 ENGINE

TIGHTENING TORQUES

Cylinder head	1 m.daN/2.2 m.daN
Cylinder casings	1 m.daN
Transmission cover	1 m.daN
Inlet manifold	1 m.daN
Camshaft gear	2 m.daN
Camshaft gear cover	1 m.daN
Chain tensioner	1 m.daN
Chain tensioner	1 m.daN
Conrod and crankshaft assembly gear	7 m.daN
Clutch housing	6 m.daN
Clutch pressure plate	0.6 m.daN
Oil pump	0.7 m.daN
Gearshift star	0.8 m.daN
Gearshift lock	1 m.daN
Clutch thrust bearing locknut	0.8 m.daN
Starter motor	1 m.daN
Rotor	7 m.daN
Flywheel magneto cover	1 m.daN
Gearbox drain plug	2 m.daN
Spark plug	1.2 m.daN

SPECIAL TOOLS

	MH Code	Designation	Used with
	2541002000214	Casing extractor and opening twl	Casing opening plate + pin
	2541002000215	Shouldered centering tool	2541002000214
	2541002000216	Pin Ø12 pitch 125	2541002000221
	2541002000217	Engine mount	Engine mount adapter
	2541002000218	Flywheel clamp	
	2541002000219	Externa1 circlips pliers	
	2541002000220	Protective end-piece large model	2541002000214

	MH Code	Designation	Used with
	2541002000221	Pin nut	2541002000216
	2541002000222	Clutch lever lip seal fitting tool	
	2541002000223	Fixed flange locking tml	
	2541002000224	Valve lifter	
	2541002000225	Engine mount adapter	2541002000215
	2541002000226	Flywheel puller	
	2541002000227	Casing opening plate	2541002000214

(*) New or modified twmh.

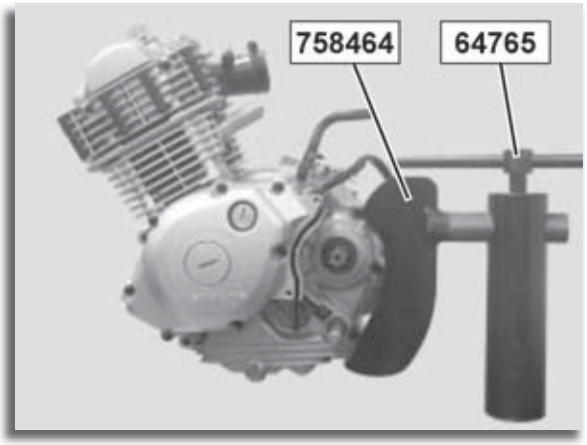
6 ENGINE

CYLINDER HEAD / CYLINDER / PISTON

PUTTING THE ENGINE ON THE STAND

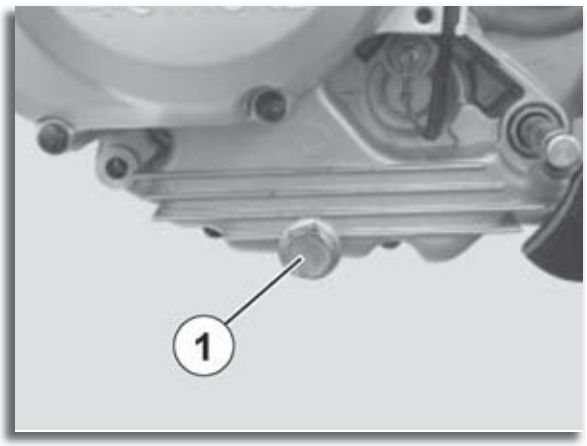
• Fit the engine to adapter P/N 758464.

• Put the assembly on stand P/N 64765 clamped in the jaws of a vice.



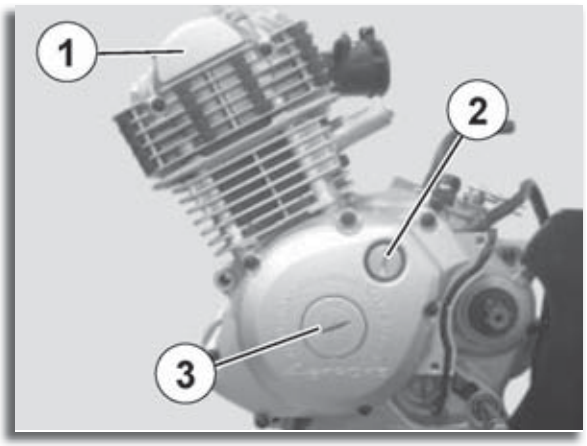
• Remove the bolt (1) in order to drain off the gearbox

Tightening torque: 2 m.daN.

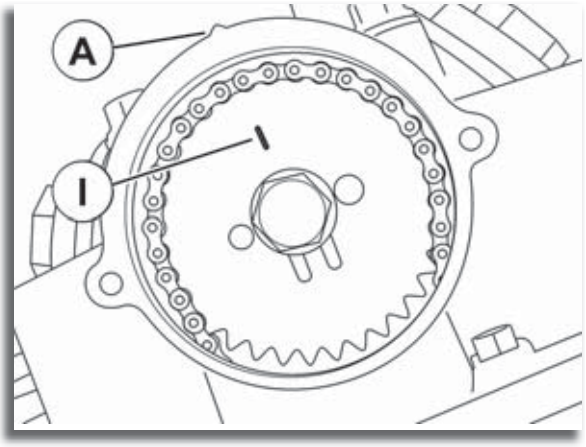


REMOVAL OF THE CYLINDER HEAD

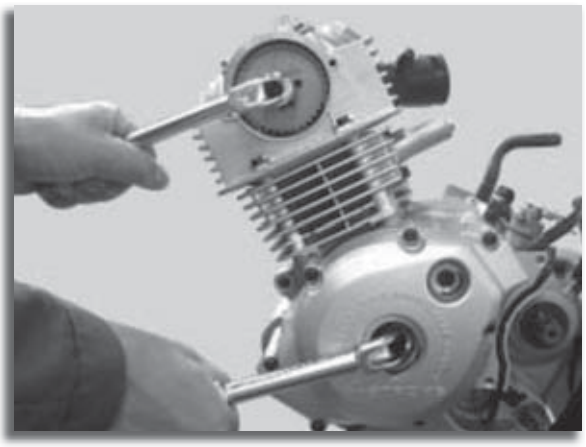
• Removal of the camshaft gear cover (1).
• Removal of the timing mark plug (2).
• Removal of the central plug (3).



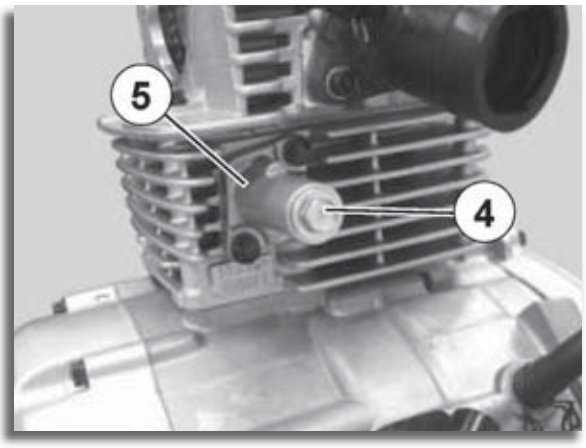
• Using a wrench, turn the crankshaft counterclockwise so as to align the crankshaft gear mark (I) with the cylinder head mark (A).



• Immobilize the conrod and crankshaft assembly by means of the flywheel magneto nut.
• Remove the camshaft gear bolt.



• Removal of the chain tensioner (5) plug (4).
• Removal of the chain tensioner.
• Remove the camshaft gear.



Tie a wire to the timing chain in order to prevent it from falling into the crankcase.

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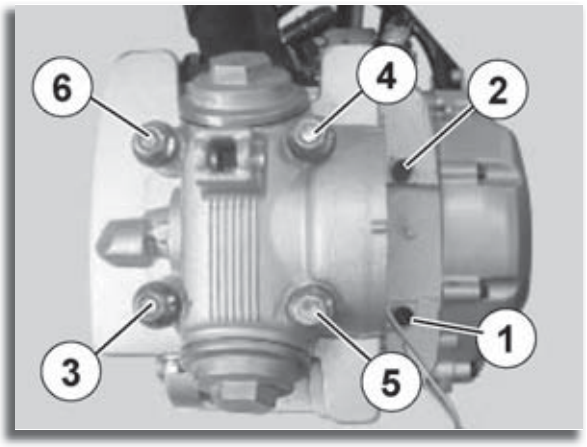
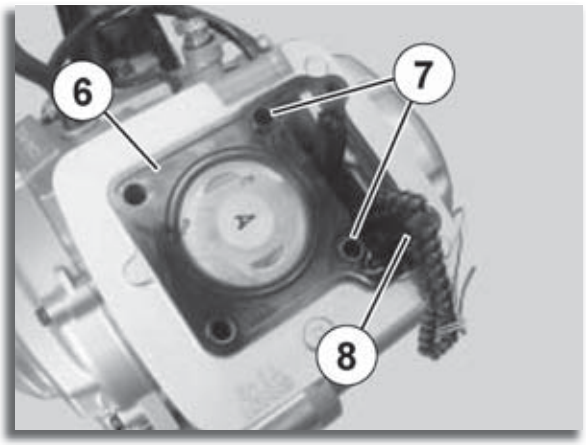
• Slacken off the cylinder head/cylinder 6 mounting bolts in the order shown, in 2 or 3 stages.
• Remove the cylinder head.

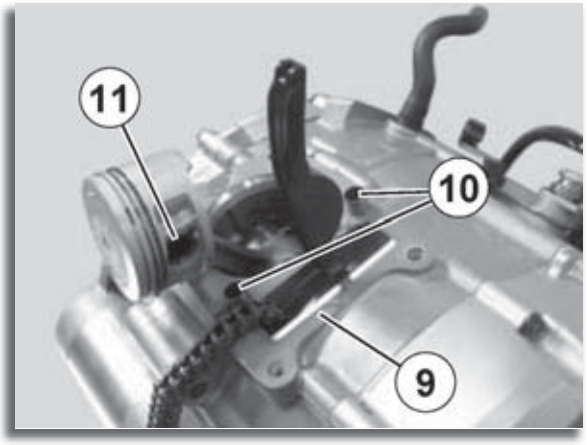


REMOVAL OF THE CYLINDER / PISTON

• Removal of the metal gasket (6) and the 2 centring pillars (7).
• Remove the chain guide pad (8).
• Removal of the cylinder and its O-ring.



• Remove the base gasket (9) and the 2 centring pillars (10).
• Remove one of the spring clips (11) using pliers P/N 752000.
• Remove the gudgeon pin.
• Remove the piston.

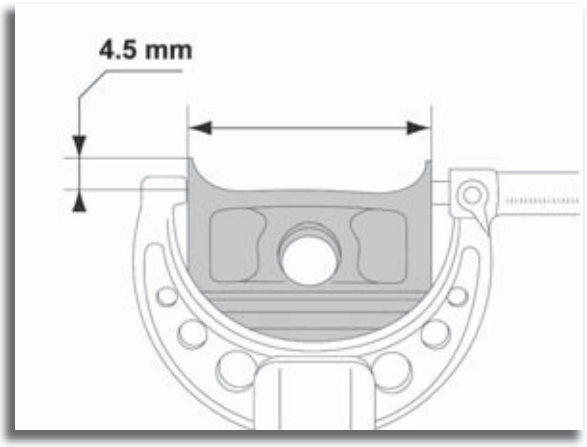


CHECKING THE CYLINDER

• The cylinder should show no traces of scoring or seizure.
  • Cylinder diameter: 54.000 to 54.018 mm.

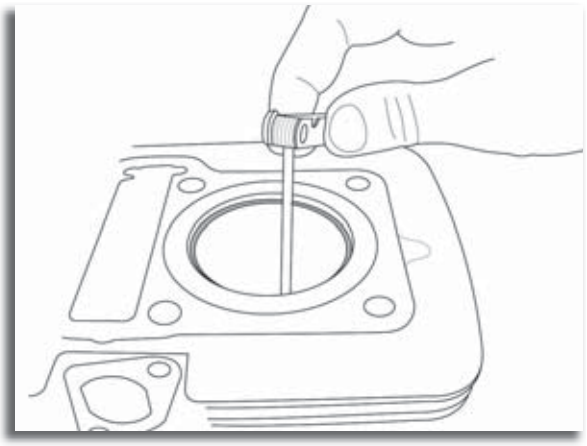
CHECKING THE PISTON

• The piston should show no traces of scoring or seizure.
• The rings must be free in their grooves.
• Measure the piston diameter at 4.5 mm from the piston skirt.
  • Piston diameter: 53.977 to 53.996 mm.
  • Cylinder & piston set: 0.020 to 0.028 mm.
  • Utilisation limit: 0.15 mm.



CHECKING THE PISTON RINGS

• Carefully remove the piston rings.
• Place a ring in the bore parallel to it and measure the gap using a feeler gauge.
  • Piston ring gap: 0.15 to 0.30 mm.
  • Utilisation limit: 0.4 mm.

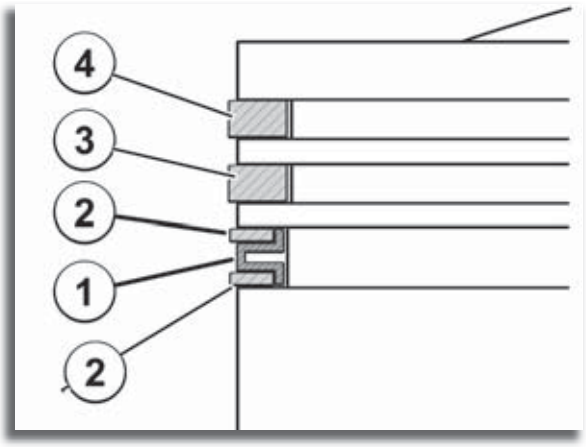


6 ENGINE

INSTALLING THE PISTON RINGS ON THE PISTON

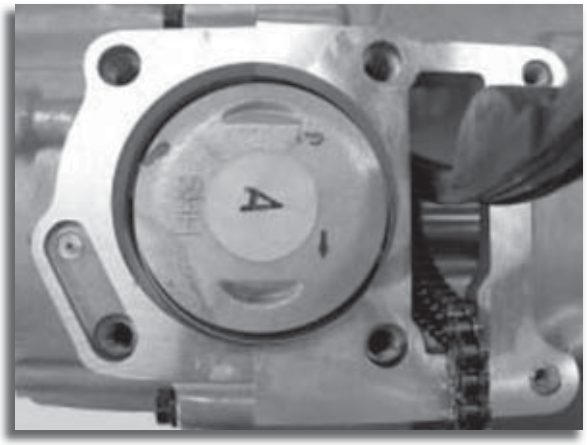
• Proceed in the following order in order to install the oil control rings.
  • Install the spring (1) (no special direction).
  • Install the 2 piston rings (2) on each side of the spring by offsetting the gap of each ring (no special direction).

• Install the compression ring (3) by placing the"TOP" mark upwards.
• Install the compression ring (4) by placing the "TOP" mark upwards.

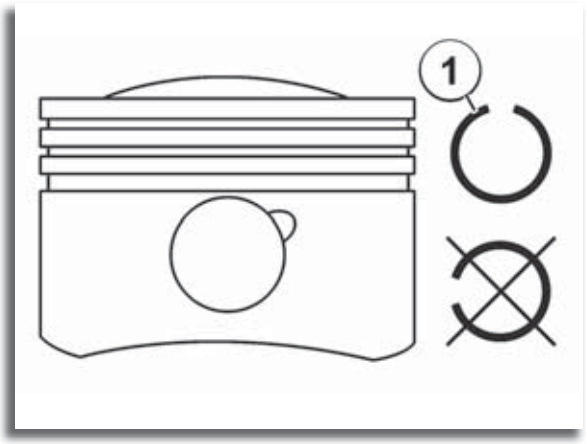


FITTING THE PISTON

• Install the piston with its arrow stamped into the piston crown pointing at the exhaust.
• Fit the gudgeon pin and circlips.



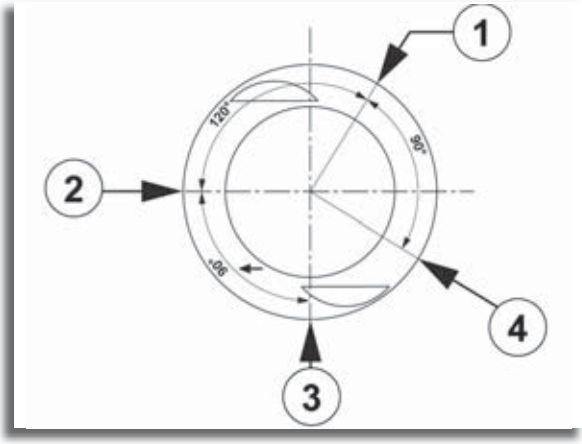
• The circlip gaps (1) must face upwards or downwards, but under no circumstances to the side.



The circlips must be changed every time they are removed.

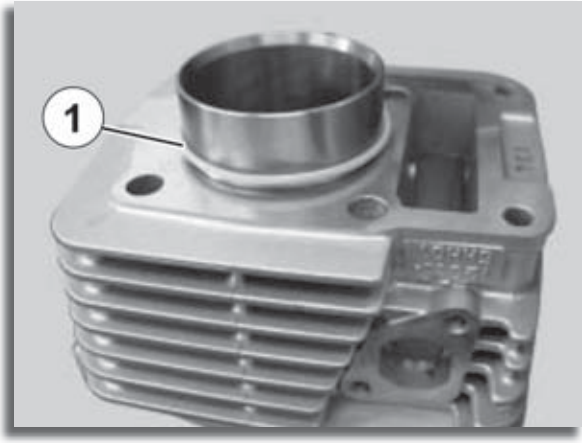
• Position the piston ring gap as follows.

1. Top compression ring gap.
2. Compression ring gap.
3. Upper oil control ring gap.
4. Lower oil control ring gap.

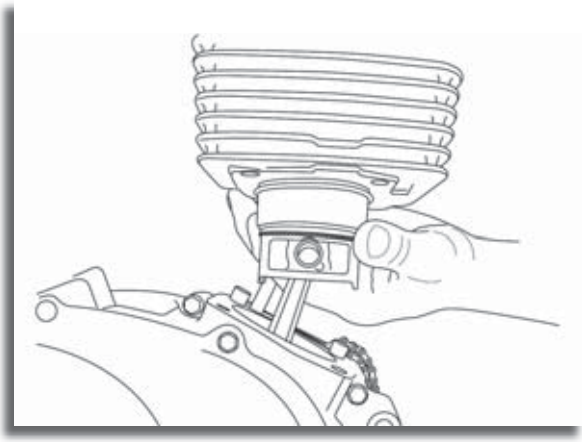


FITTING THE CYLINDER

• Install the cylinder base gasket and the 2 guiding pillars on the crankcase.
• Fit a new O-ring (1) on the cylinder skirt.



• Fit the cylinder over the piston by compressing the piston rings by hand.
• Fit the chain and the chain guide tensioner into the timing chain tunnel.



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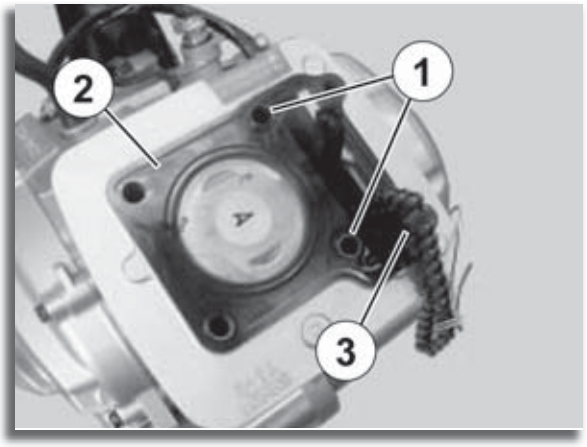
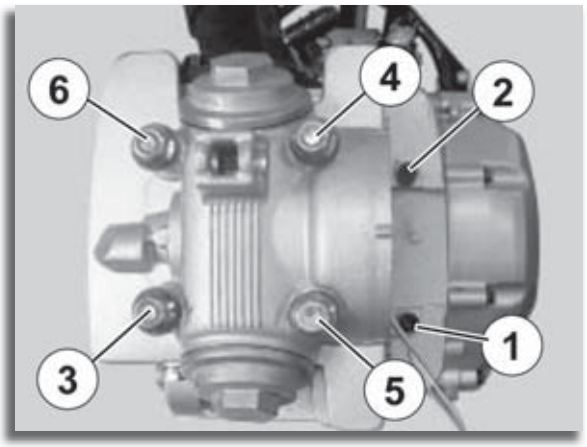
FITTING THE CYLINDER HEAD

• Fit the 2 guiding pillars (1) and the metal gasket (2) on the cylinder.
• Fit the chain pad (3).



• Install the cylinder head.
• Slightly lubricate the thread of the 6 screws that secure the cylinder head.
• Fit the 6 screws.
• Tighten in 2 or 3 sequences the 6 screws that secure the cylinder head in the indicated direction.

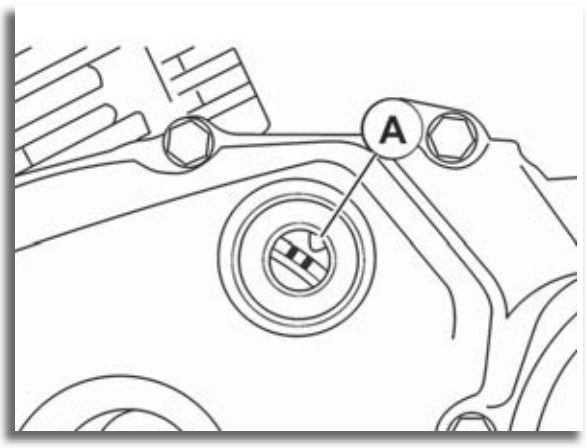
Tightening torque:
- 6 mm diameter screw: 1 m.daN.
- 8 mm diameter screw: 2.2 m.daN.



FITTING THE CAMSHAFT GEAR

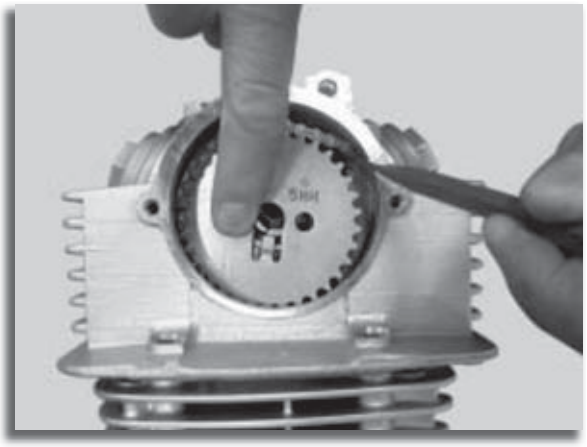
SETTING THE TIMING

• Pivot the engine to the right.
• Rotate the conrod and crankshaft assembly so as to align the marks of flywheel magneto with the mark (A) of the cover..

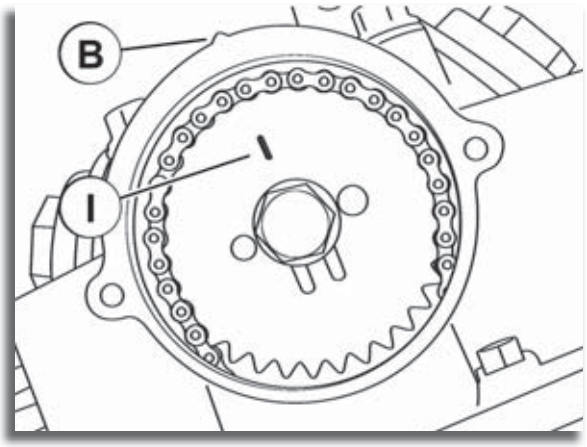


Remove the wire that holds the timing chain.

• Fit the gear in the chain on one of the sides.
• Using a tool with a small diameter, finish fitting the chain around the gear.
• Fit the gear on the camshaft.

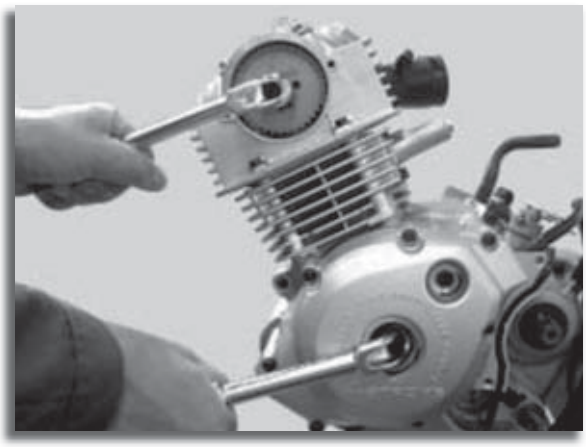


• Make sure the mark (I) of the camshaft gear isaligned with the mark (B) of the cylinder head.
• If necessary, dislodge the gear from the camshaft without removing it and move the chain around the gear on the required side.
• Install the camshaft gear.



• Immobilize the flywheel magneto using a wrench and pre-tighten the camshaft gear.

Tightening torque: 2 m.daN.



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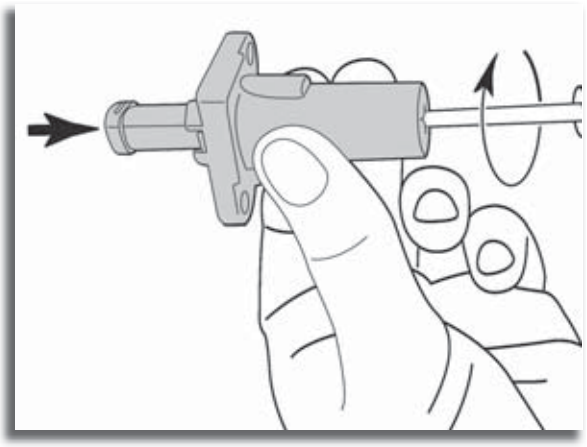
• Loosen the chain tensioner as indicated.

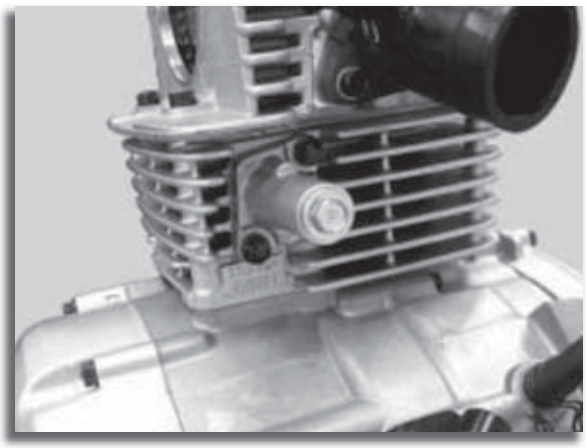


• Fit the chain tensioner seal (respect the position of installation).
• Install the chain tensioner and the 2 attachment screws.

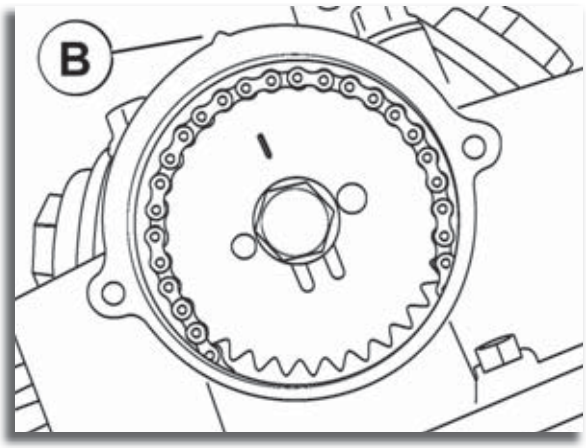
Tightening torque: 1 m.daN.

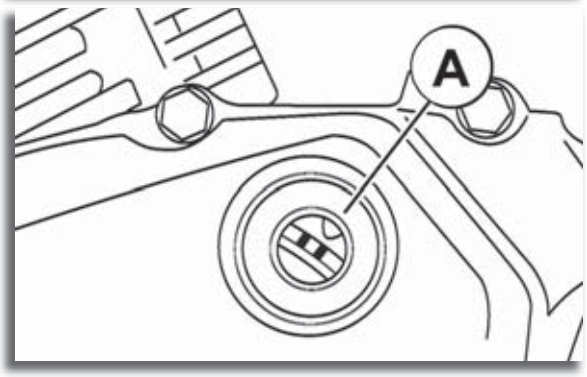
• Install the tensioner cap.

Tightening torque: 0.8 m.daN.



• Check the alignment of the timing marks of the flywheel magneto with the mark (A) of the cover, and of the camshaft gear with the mark (B) of the cylinder head.
• In case of misalignment, start the operation again from the beginning.

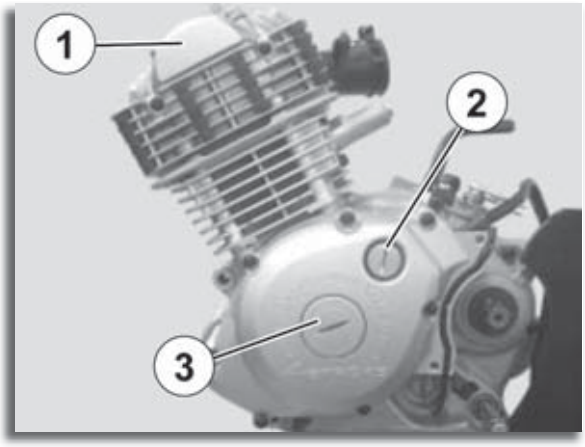




• Install the timing gear (1) cover.

Tightening torque: 1 m.daN.

• Install the timing mark cap (2).
• Fit the central cap (3).



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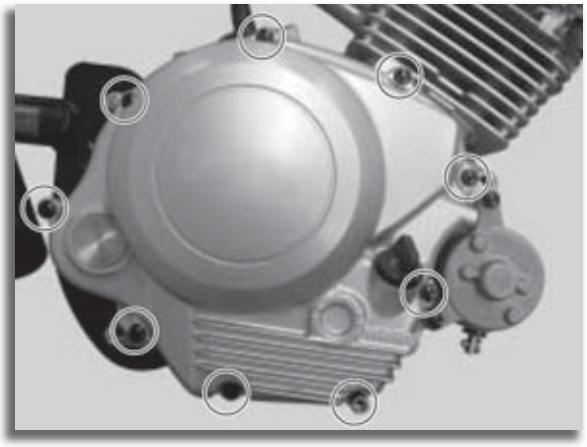
CLUTCH

REMOVAL OF THE CLUTCH

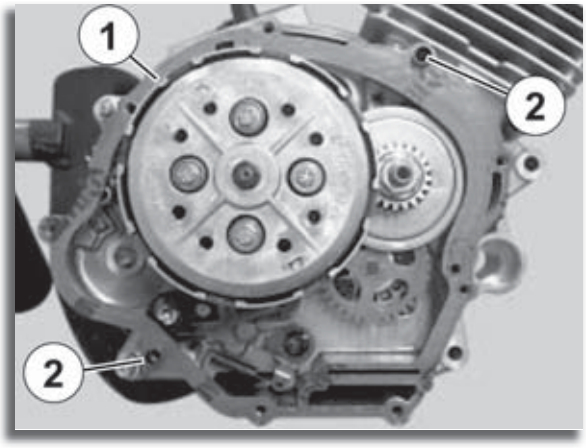


REMOVAL OF THE OIL PUMP

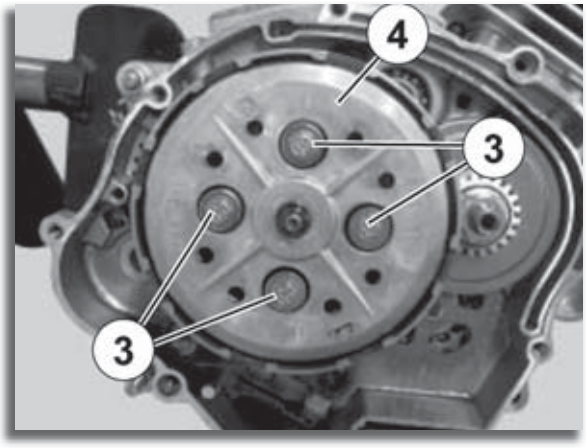
- Remove the starter motor.
- Remove the transmission cover 9 fixing bolts.
- Remove the transmission cover.

Tightening torque: 1 m.daN.

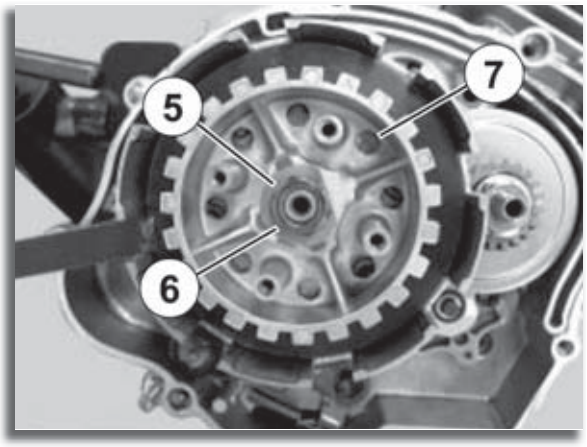
- Remove the paper gasket (1) and the 2 locating pins (2).



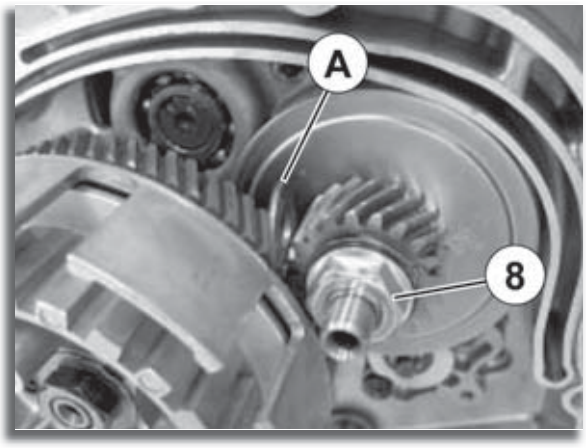
- Remove the 4 bolts and spring (3) from the pressure plate (4).
- Remove the set of 5 lined discs and the 4 smooth discs.
- Remove the ball from the transmission input shaft.



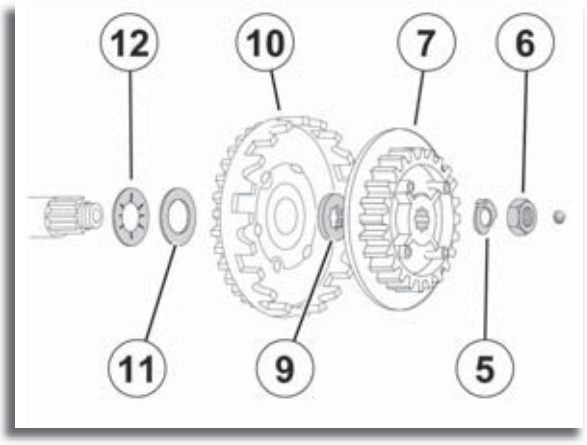
• Fold down the clutch nut (6) lockwasher tab (5).
• Lock the clutch main shaft (7) with tool P/N 753731.
• Remove the nut and the washer.



• Immobilize the gears by fitting a copper washer (A) between the gears.
• Loosen and remove the nut (8) from the conrod and crankshaft assembly and the washer.



• Remove:
  • The clutch main shaft. (7)
  • The splined bush. (9)
  • The clutch housing. (10)
  • The plain washer. (11)
  • The tapered washer. (12)



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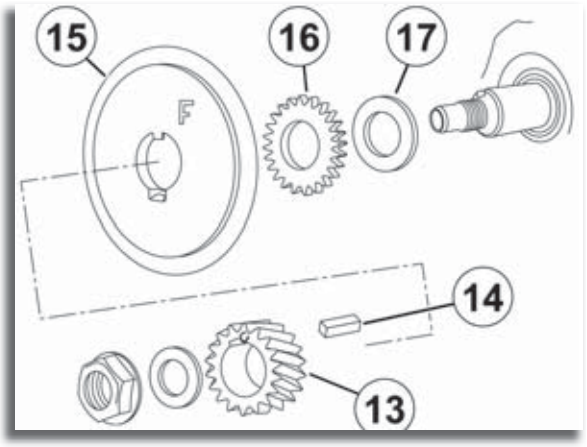
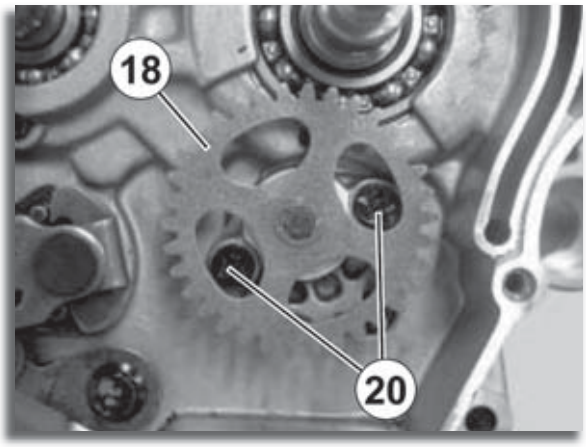
- Remove the pinion (13).
- Remove the key (14) from the crank.
- Remove the centrifugal filter (15).
- Remove the drive gear from the oil pump (16).
- Remove washer (17).

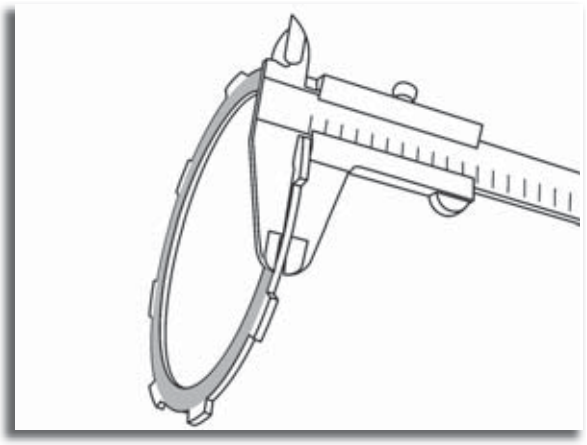


- Remove the circlip.
- Remove the pinion (18).
- Remove the tapered washer.
- Remove the oil pump 2 fixing bolts. (20)
- Remove the oil pump and its gasket.

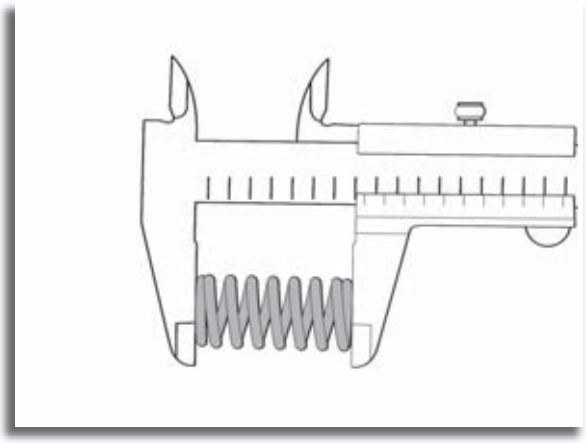


CHECKING THE CLUTCH

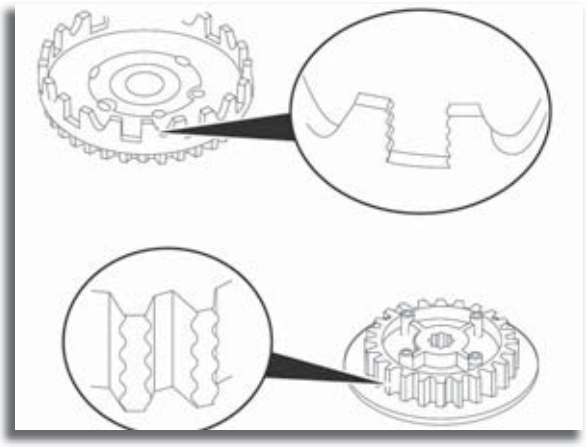
- Measure the thickness of the lined discs.
  - Disc thickness: 3 mm.
  - Utilisation limit: 2.8 mm.



- Measure the length of the springs.
  - Spring length: 33 mm.
  - Utilisation limit: 31 mm.



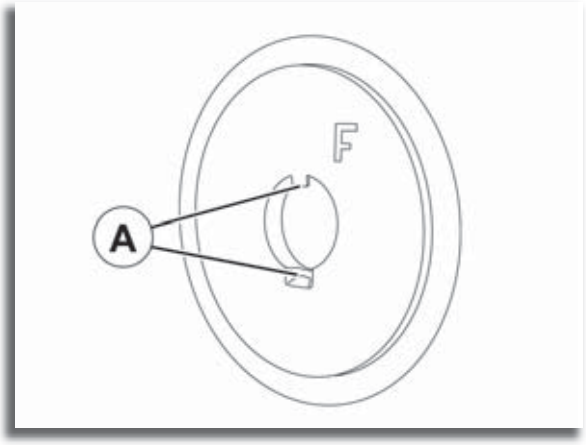
- Check the condition of the notches of the clutch housing and the condition of the splines of the clutch gear.
- In case of severe wear replace the parts.



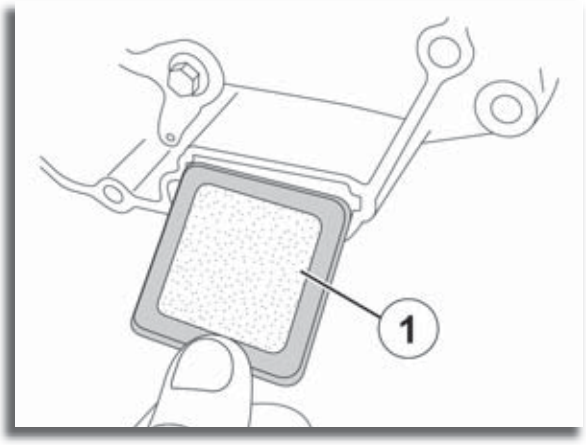
6 ENGINE

CHECKING AND CLEANING THE OIL FILTERS.

• Clean the centrifugal filter by dipping it into a cleanser.
• Blow through the holes (A) of the centrifugal filter with compressed air.

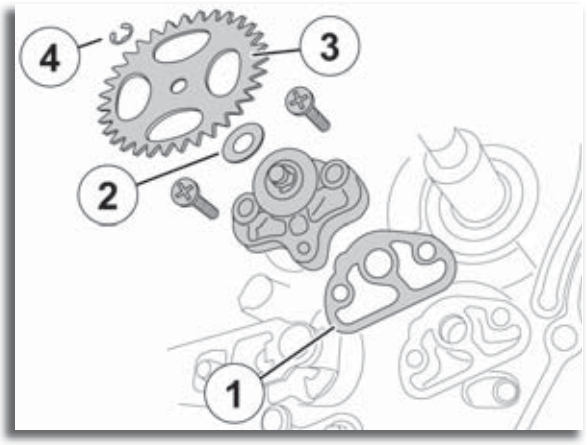


• Check and clean the strainer. (1)



FITTING THE OIL PUMP

• Install the oil pump and a new gasket (1).

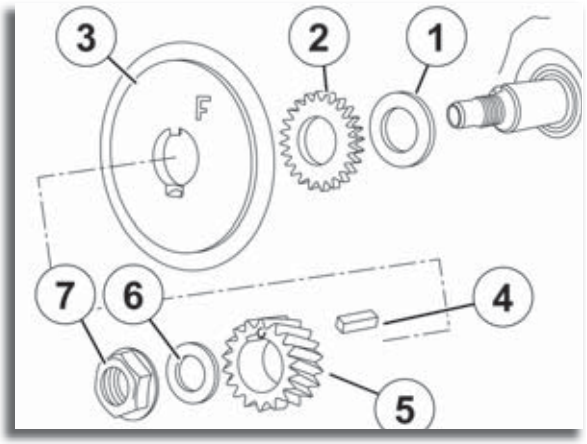


Tightening torque: 0.7 m.daN.

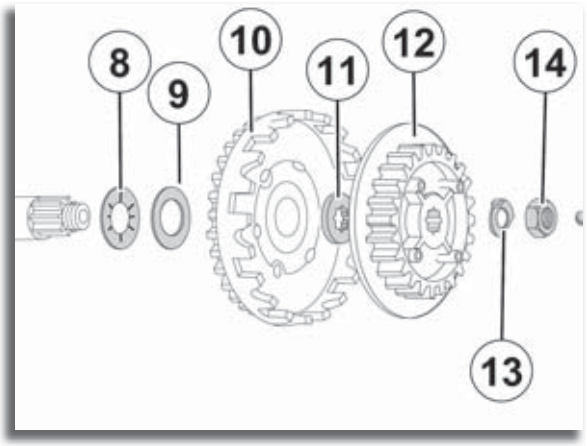
• Install the tapered washer (2), the humped side to the oil pump.
• Install the pinion. (3)
• Install the circlips. (4)

FITTING THE CLUTCH

• Install the conrod and crankshaft assembly:
  • The washer (1).
  • The pinion. (2).
  • The centrifugal filter (3), the (F) mark outwards.
  • The key. (4)
  • The pinion (5) the (C) mark outwards.
  • The washer (6) and the nut (7).



• Fit to the primary shaft:
  • The tapered washer (8) with the round endtowards the bearing.
  • The plain washer. (9)
  • The clutch housing. (10)
  • The splined bush. (11)
  • The clutch main shaft. (12)
  • The tab washer (13) and the nut (14).



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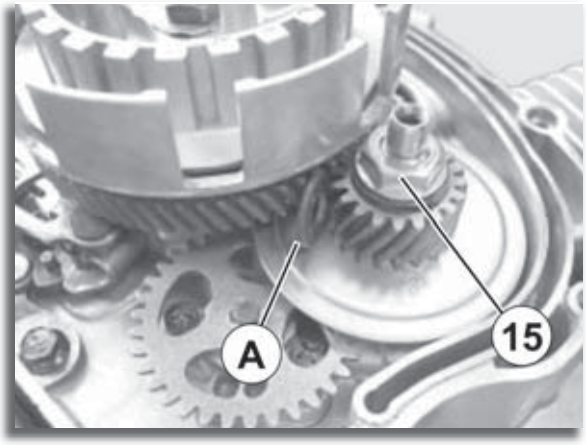
• Immobilize the gears by fitting a copper washer (A) between the gears.
• Tighten the nut. (15)

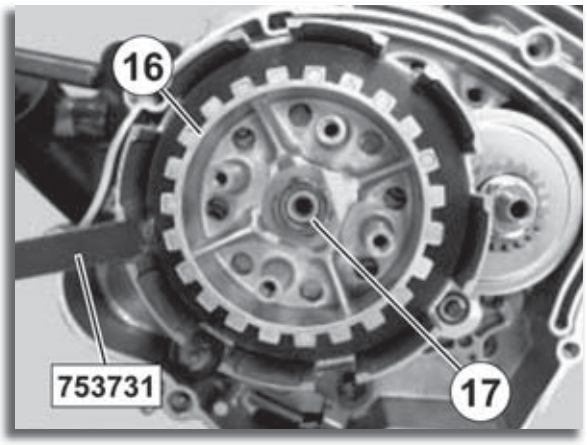
Tightening torque: 7 m.daN.



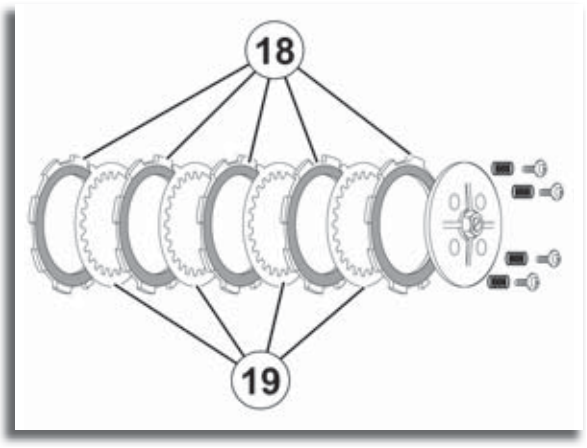
• Lock the clutch main shaft 16 with tool P/N 753731.
• Tighten the nut. (17)

Tightening torque: 6 m.daN.

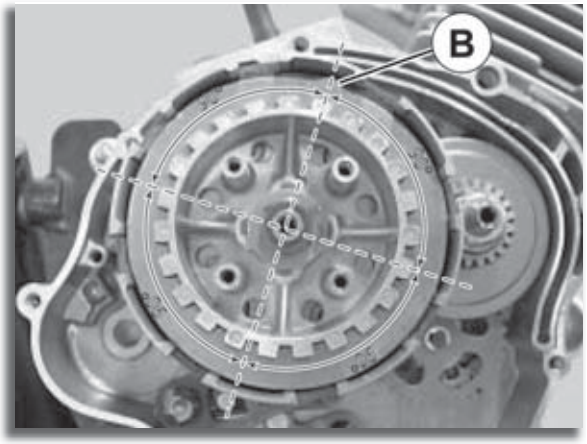
• Fold over the clutch nut washer locking tab.
• Fit the ball into the input shaft.



• Fit the clutch discs starting with a lined disc (18) and then alternate smooth and lined discs (19).

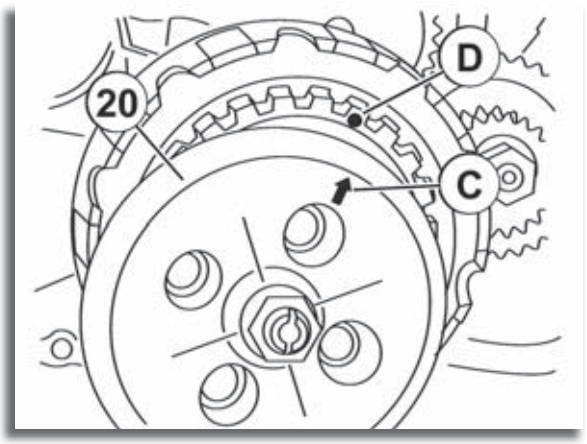


• When re-assembling, ensure that the marks (B) on the smooth discs are offset by 90° from the others.

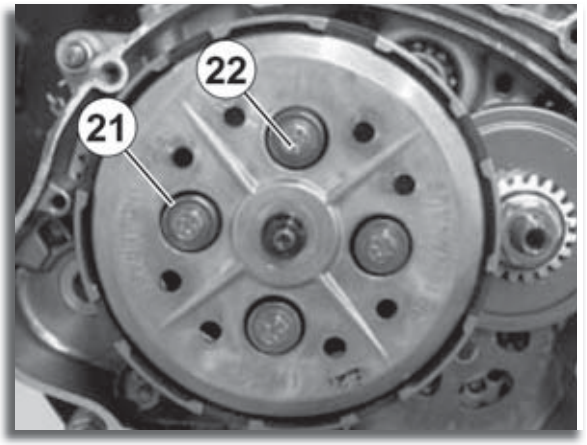


• Fit the pressure plate (20) lining up the arrow (C) on the plate with the round imprint (D) on the clutch main shaft.

Tightening torque: 0.6 m.daN.



• Fit the pressure plate springs (21) and the 4 bolts and washers (22).



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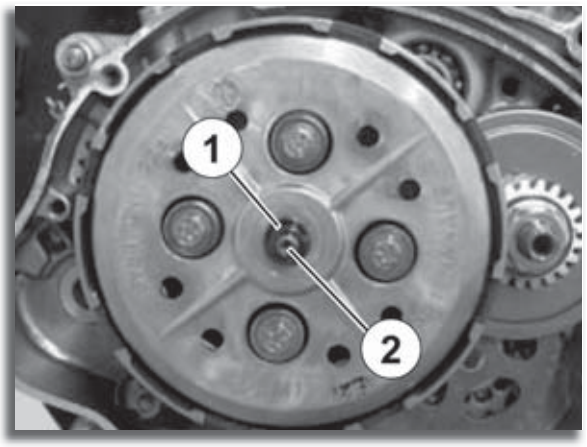
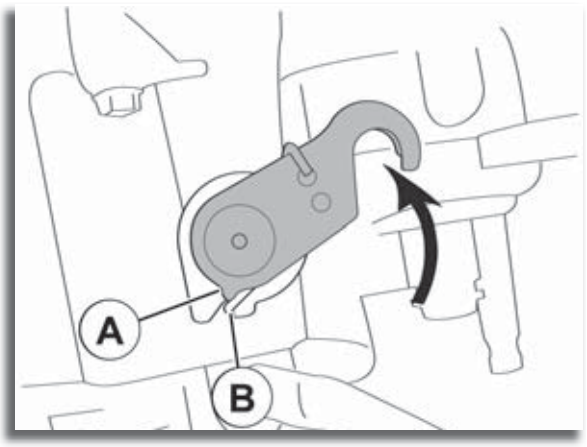
ADJUSTING THE CLUTCH CONTROL LEVER



• Slacken the pressure plate locknut (1).

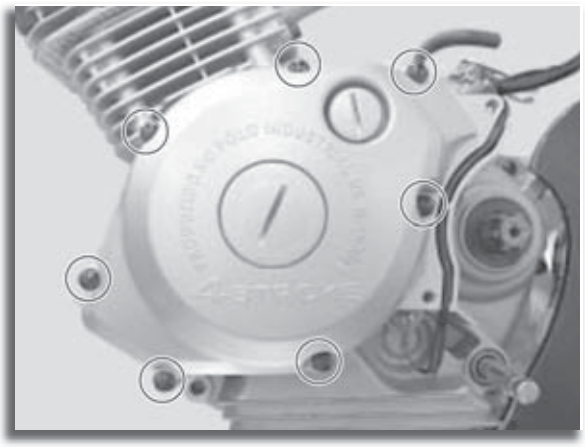
• Bring the lever into contact with the control rod.
• Check that the mark (A) of the lever is lined up with the notch (B) of the crankcase.
• It is isn't, adjust with the screw (2).
• Tighten the locknut without altering the adjustment.



Tightening torque: 0.8 m.daN.

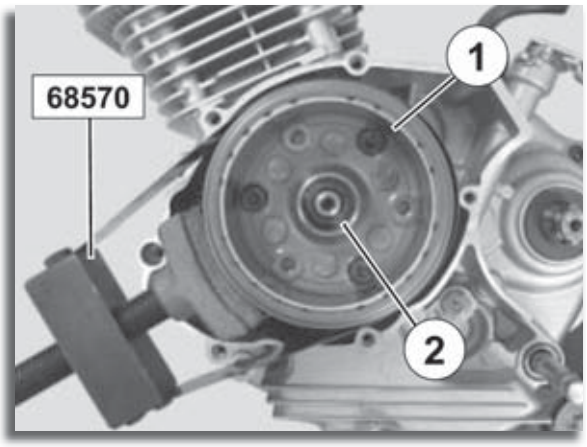
MAGNETO FLYWHEEL

TO REMOVE THE MAGNETO FLYWHEEL



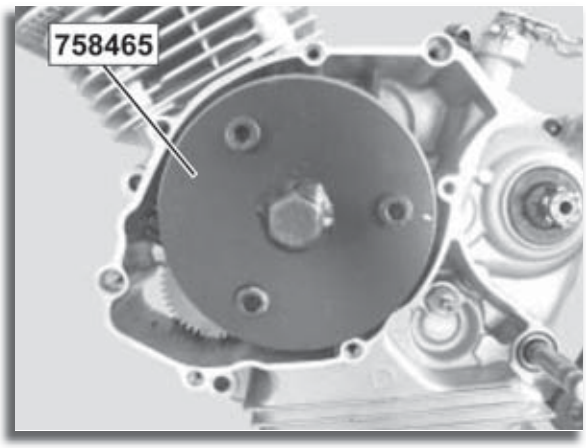
- Remove the 7 bolts that secure the cover.
- Remove the flywheel magneto cover.
- Remove the paper gasket and the two 2 centering pins.

Tightening torque: 1 m.daN.



- Immobilize the rotor (1) using the flywheel clamp P/N 68570.
- Remove the nut. (2)

Tightening torque: 7 m.daN.



- By means of the 3 screws, secure the flywheel extractor P/N 758465 to the flywheel magneto.
- Lock the flywheel extractor and turn the thrust bolt until the rotor is released.
- Remove the rotor and the overrunning clutch.
- Remove the washer under the rotor.

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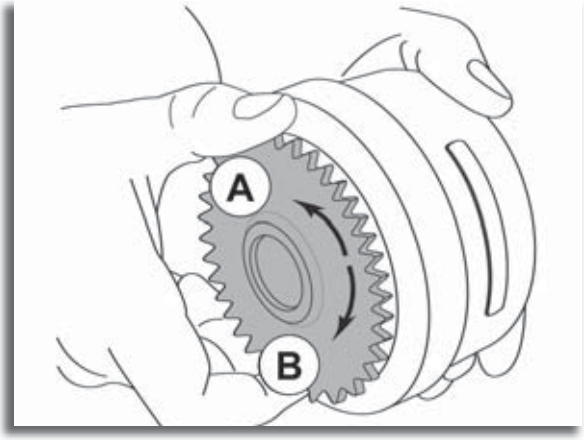
CHECKING THE OVERRUNNING CLUTCH

- Rotate the overrunning clutch by hand.
  - It must rotate in direction (A).
  - It must be block in direction (B).

- If it doesn't, replace the overrunning clutch.



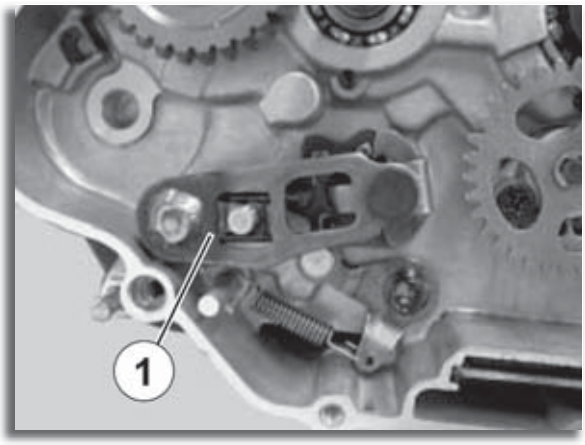
GEARBOX/CONROD AND CRANKSHAFT ASSEMBLY

REMOVAL OF THE GEARBOX

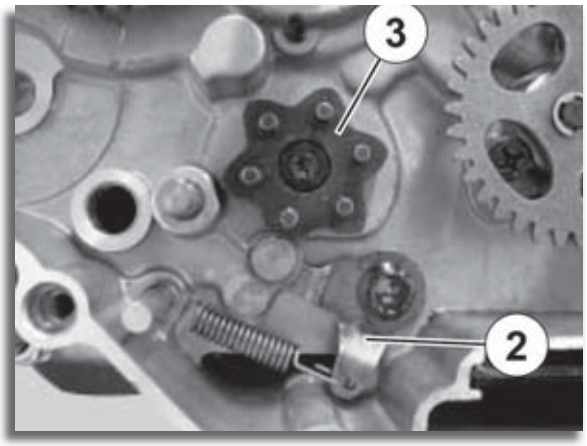
REMOVAL OF THE CRANKSHAFT

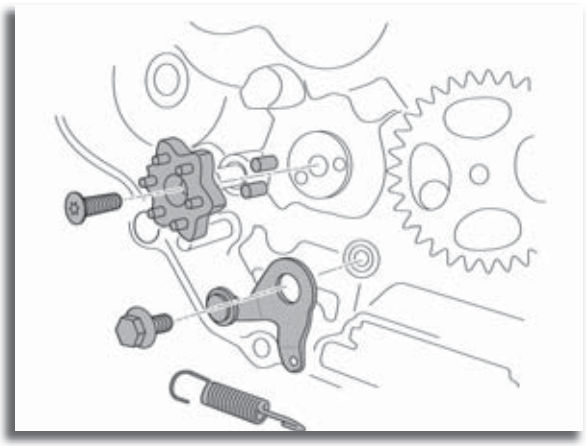
- Remove the cylinder head.
- Remove the cylinder and the piston.
- Remove the primary drive.
- Remove the flywheel magneto rotor.

- Remove the gear shift shaft (1).



- Remove the screw that secures the star locking lever (2).
- Remove the lever and its spring.
- Remove the star clamping screw (3).
- Remove the star and its 2 centering pins.





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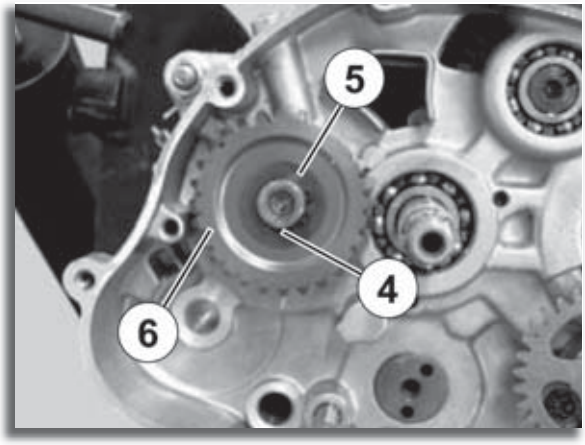
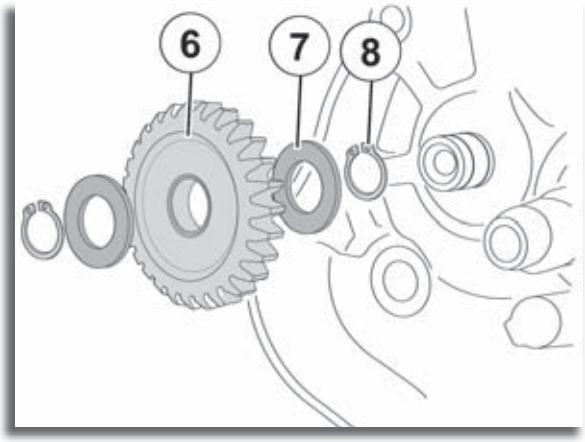
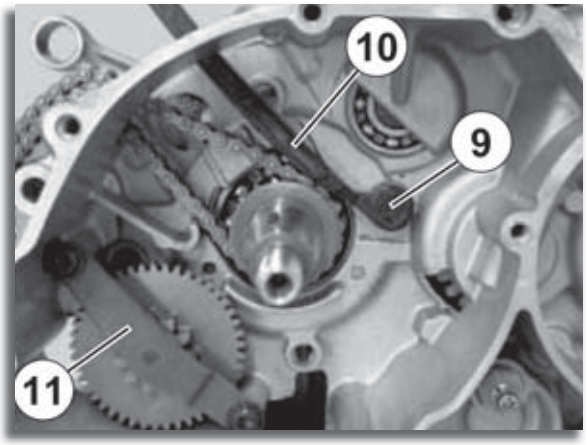
- Remove:
  - The circlip. (4)
  - The washer (5).
  - The starter drive pinion. (6) (*)
  - The plain washer. (7)
  - The circlip. (8)



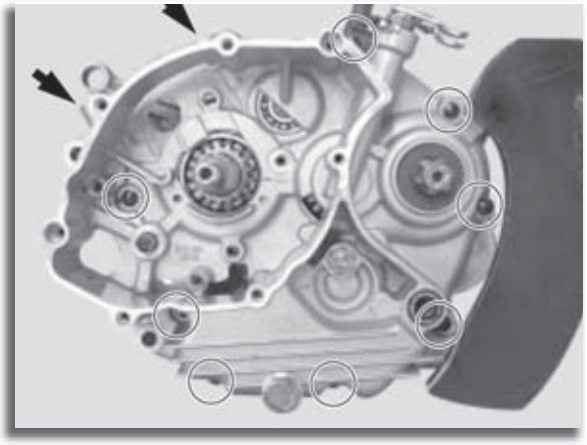
(*) The kick starter pinion is on the engine but it is not used.



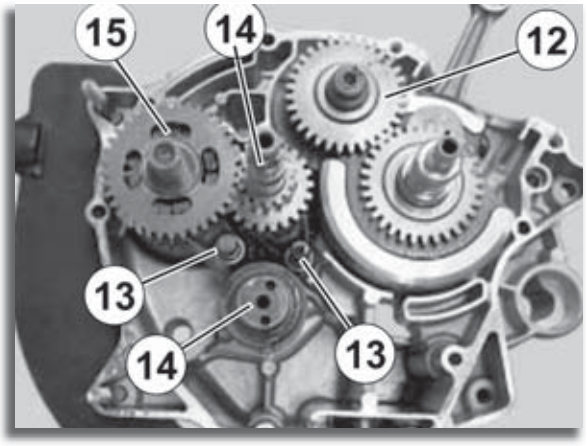
- Remove the screw which secures (9) the chain tensioner slipper (10).
- Remove the chain tensioner slipper.
- Remove the timing chain and notice its direction of rotation.
- Remove the 2 screws of the starter pinionholder plate (11).
- Remove the starter drive pinion.



• Remove the 10 screws from the LH crankcase, 2 of which are located on the RH crankcase.
• Remove the 2 nuts that secure the engine to the fixture.
• Remove the RH half crankcase and the 2 centering pins.
• Fit the 2 nuts that secure the engine to the fixture.

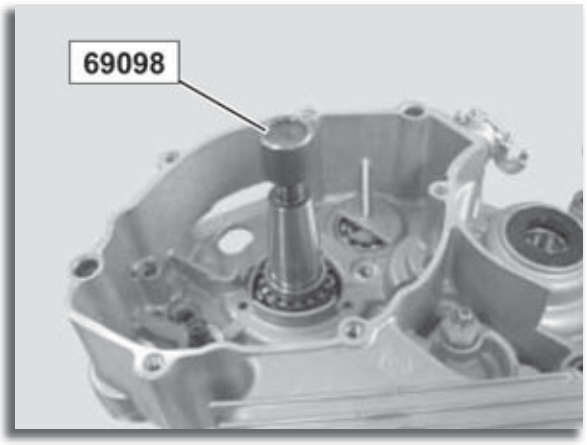


• Remove the balance shaft (12).
• Remove the 2 pins (13) of the shift forks.
• Remove the selector cylinder. (14)
• Remove the shift forks.
• Remove at the same time the input shaft (15) and secondary shaft (16) assembly.
• Remove the clutch push rod of the input shaft.



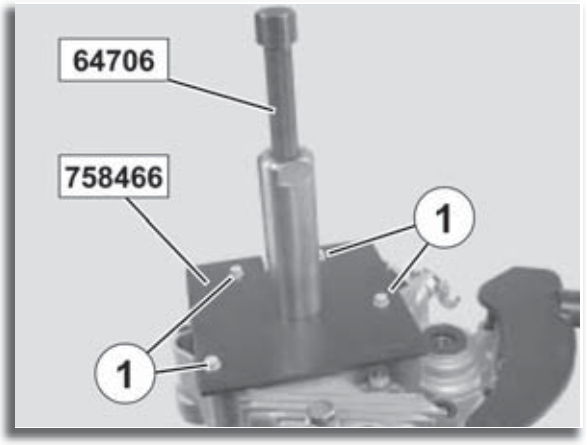
REMOVAL OF THE CRANKSHAFT

• Fit protective cap P/N 69098 to the end of the crank assembly.

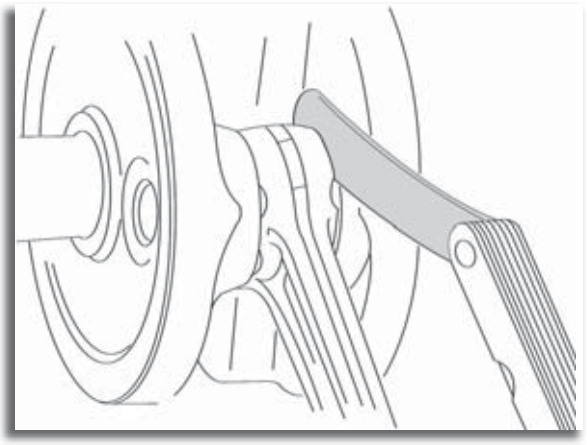


6 ENGINE

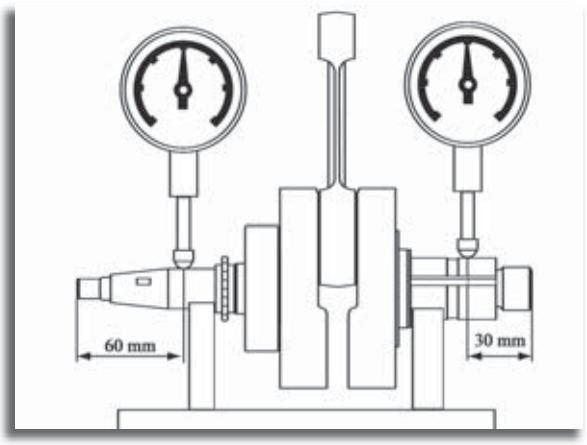
• Fit to casing with tool P/N 64706 fitted with plate P/N 758466.
• Fix the assembly to the casing using 4 bolts (1).
• Tighten the tool centre screw holding the crank with one hand on the other side until it is fully extracted.
• Removing the the cranshaft and conrod assembly.



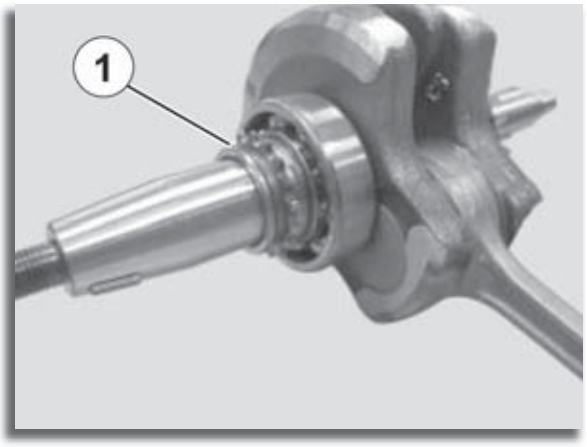
CHECKING THE CRANKSHAFT AND CONROD ASSEMBLY



- Using a set of shims, check the big end side play.
- The maximum side play on the conrod end must not exceed: 0.45 mm.



- The out-of-round values measured on the ends of the crank should not exceed 0.03 mm and must be measured:
  - 30 mm from the transmission side end.
  - 60 mm from the flywheel magneto end.



- Check the condition of the bearing and timing pinion (1).
- If there is too much play in the bearing or if the timing pinion is excessively worn, replace the conrod and crankshaft assembly.

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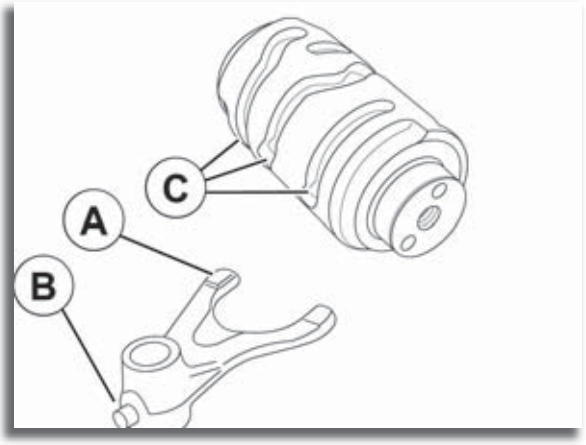
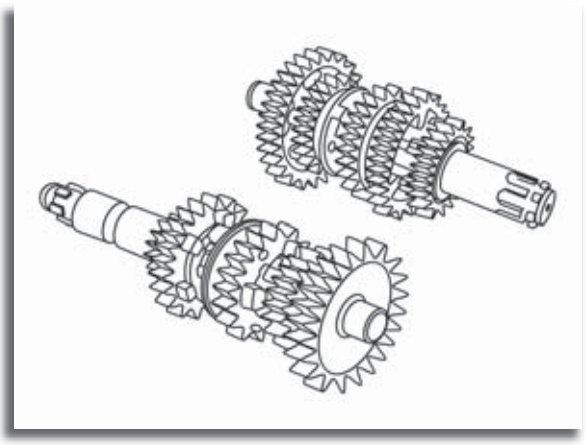
CHECKING THE GEARBOX



• Check the condition of the ends (A) and the guide (B) of the shift forks.
• Check the condition of the grooves (C) of the selector cylinder.

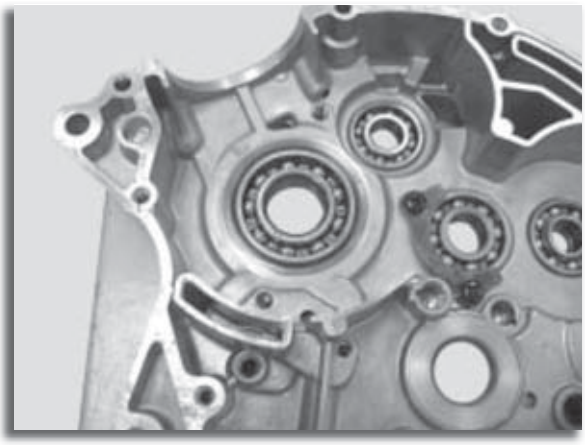


• Check the condition of every gear.
• Check that every gear slides and rotates on the corresponding shaft.
• Check the condition of the sliding gear and idler gear driving dogs.

If a component has to be changed, replace also the component which is associated.

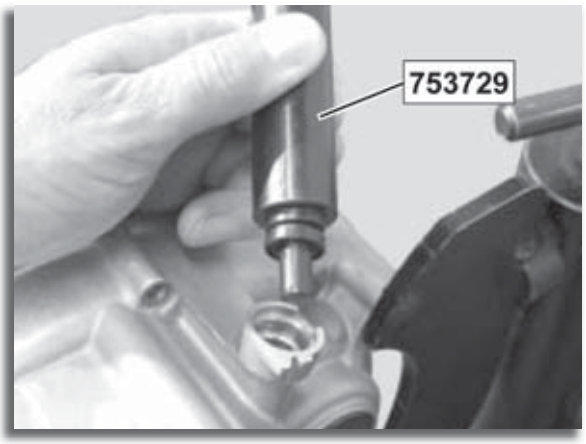
FITTING THE CRANK ASSEMBLY RH BEARING

• The bearing is positioned into the casing by means of a press.



FITTING THE SEALS AND GASKETS

• Using tool P/N 753729, fit the clutch lever seal.
• The gearbox output and gear shift shaft seals are to be positioned flush with the crankcase.



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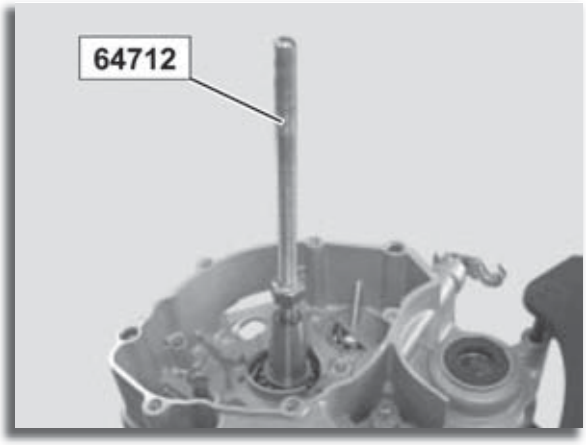
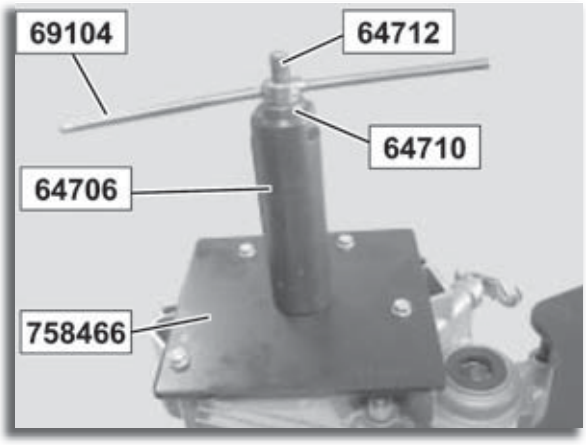
FITTING THE CONROD AND CRANKSHAFT ASSEMBLY

• Fit the conrod and crankshaft assembly into the LH crankcase.
• Tighten pin P/N 64712 at the end of the crank assembly.

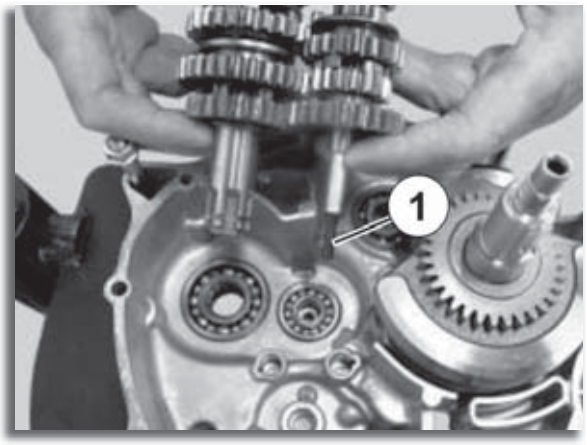


• Fit to casing with tool P/N 64706 fitted with plate P/N 758466.
• Centre the assembly to the casing with 4 bolts (1).
• Fit centring tool P/N 64710 to tool P/N 64706.
• Tighten pin nut P/N 69104 on pin P/N 64712 in order to bring the crankshat assembly into contact with the bearing ensuring that the crank is pointing towards the cylinder side.

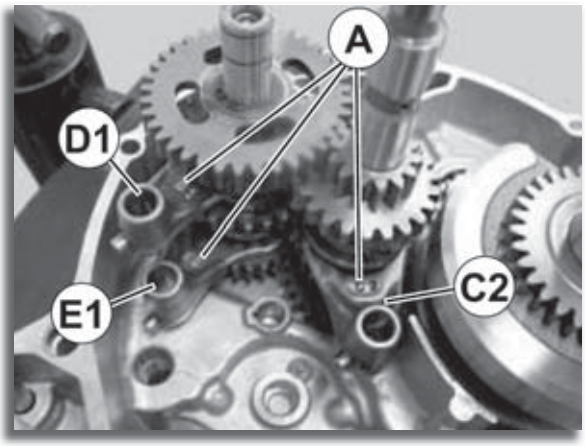


FITTING THE GEARBOX

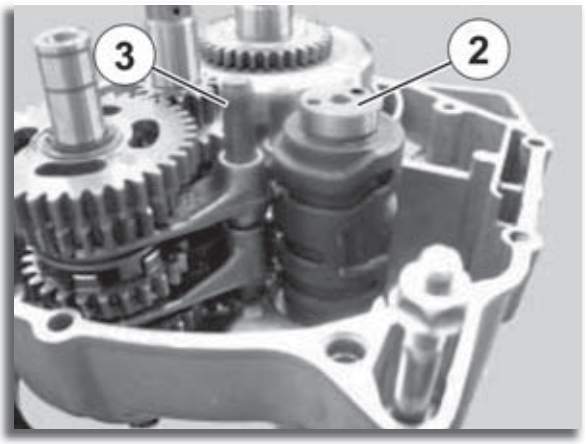
• Put the clutch pushrod (1) in the input shaft.
• Install at the same time the input shaft ans secondary shaft assembly in the LH crankcase.



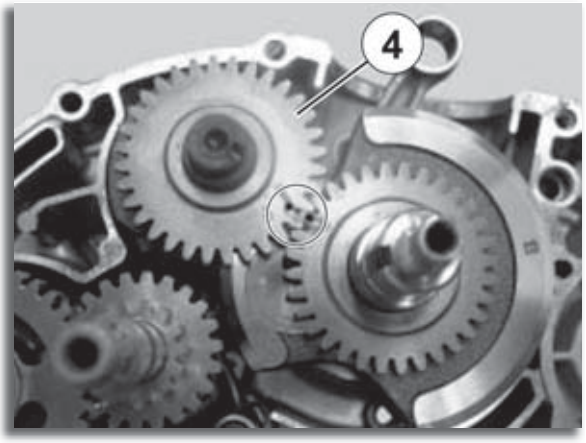
• Install the shift fork as shown.
• Marking (A) is upwards.



• Install the selector cylinder (2).
• Fit the shift fork guides into the grooves of the cylinder.
• Install the shift fork pins (3).



• Install the balance shaft (4) by lining up the mark of the balance shaft pinion with the mark of the conrod and crankshaft assembly.



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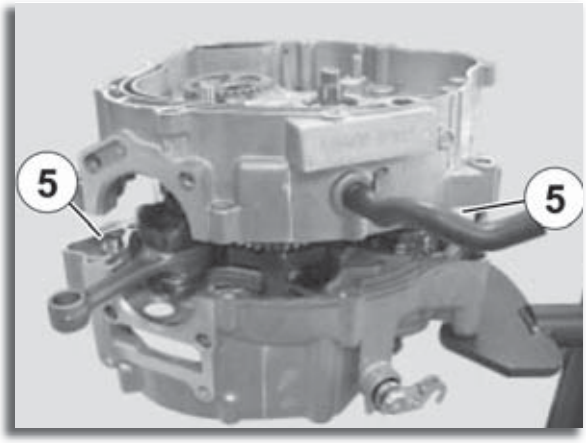
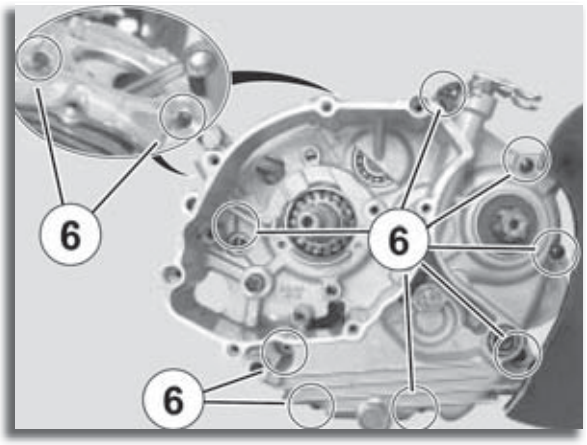
• Make sure the gasket seat of the RH and LH crankcases is perfectly clean.
• Fit the 2 centring pins (5).
• Put gasket seal paste on the LH crankcase gasket seat.
• Place the RH casing over the LH casing assembly.



No tools are necessary for assembling the casings, which shall be carried out without effort.

• Fit and tighten the 10 fixing bolts (6).

Tightening torque: 1 m.daN.

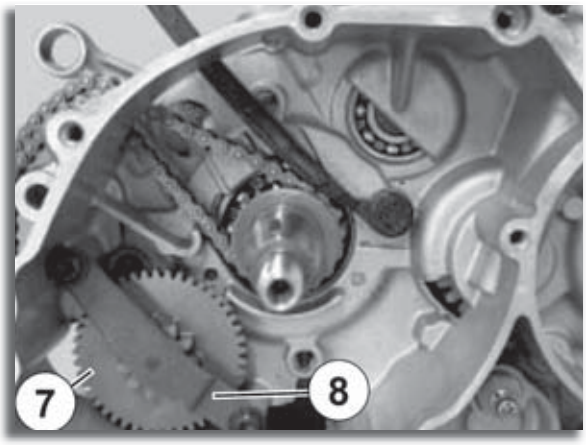


• Install the starter pinion (7).
• Install the starter pinion holder plate (8).

Tightening torque: 0.8 m.daN.

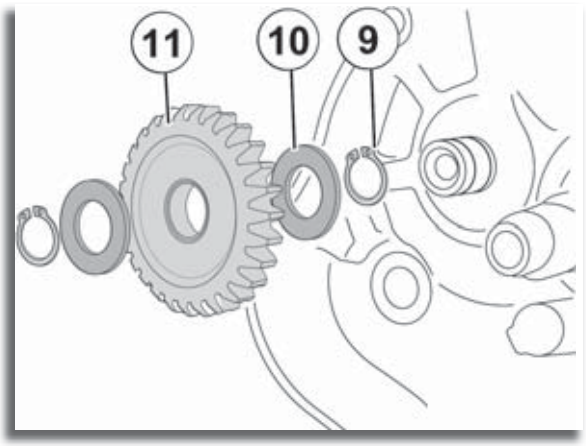
• Install the timing chain.
• Install the the chain tensioner slipper.

Tightening torque: 1 m.daN.

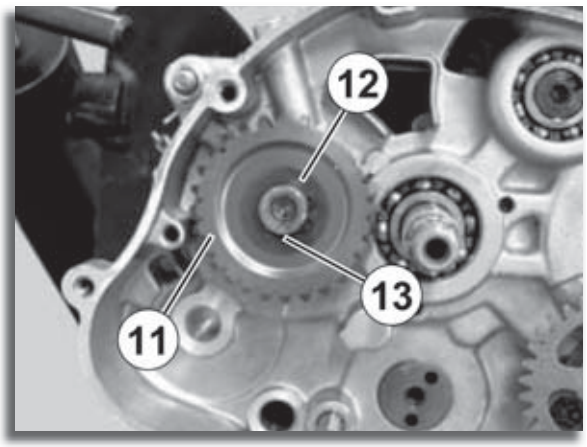


• Fit:
  • The circlip (9).
  • The washer (10).
  • The starter drive pinion (11).

(*) The kick starter pinion is on the engine but it is not used.



  • The plain washer (12).
  • The circlip. (13).



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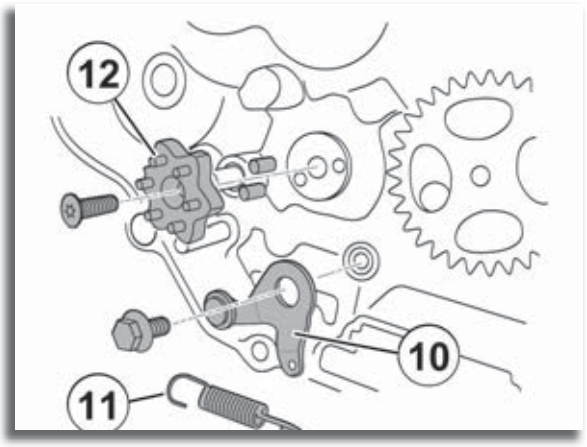
• Install the star locking lever (10) and its spring (11).

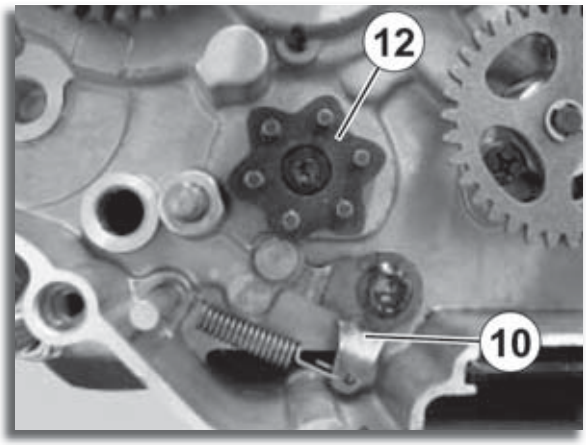
Tightening torque: 1 m.daN.

• Install the star (12) and its 2 centering pins.

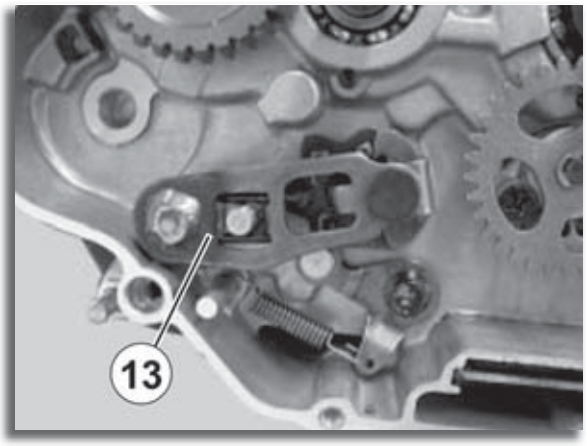


NOTE
WHEN RE-INSTALLING, FIT A SCREW WITH STANDARD THREAD LOCK.

Tightening torque: 0.8 m.daN.



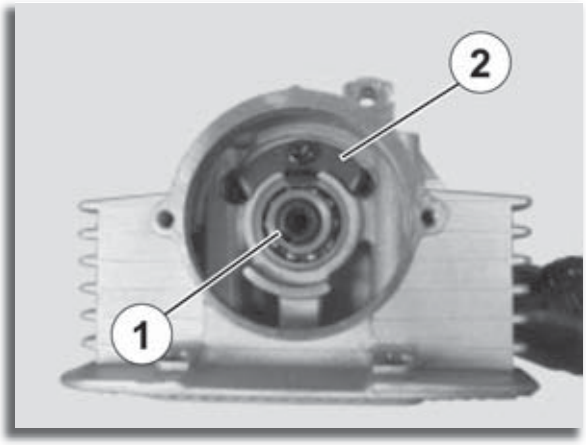
• Install the shift shaft (13).



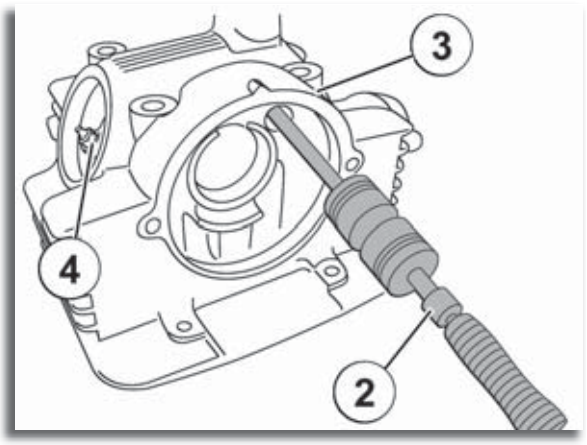
MISCELLANEOUS OPERATIONS

REMOVAL OF THE CAMSHAFT AND/OR ROCKERS

- Remove the cylinder head.
- Remove the stopper plate. (2)
- Remove the camshaft (1).

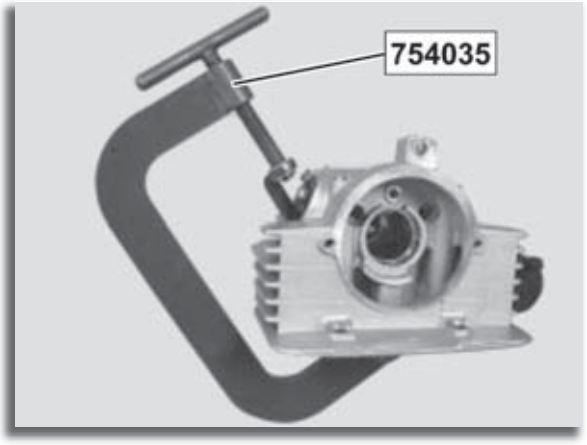


- Using the intertia extractor.
- Remove the cam follower shafts.
- Remove the inlet (3) and exhaust (4) rockers.



REMOVAL OF THE VALVES OR VALVE STEM SEALS

- Compress the spring of one of the valves using the valve lifter P/N 754035.
- Remove the 2 half cones.
- Uncompress the spring and remove the tool.



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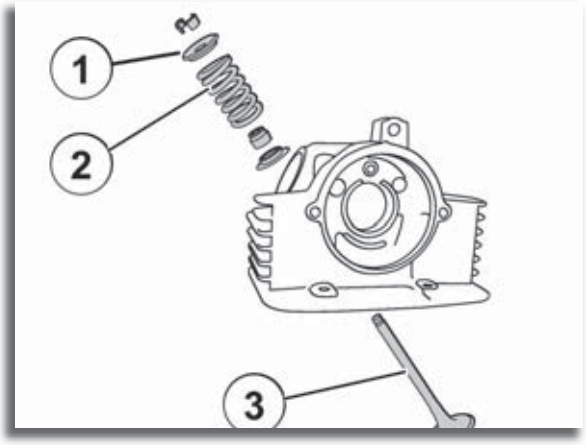
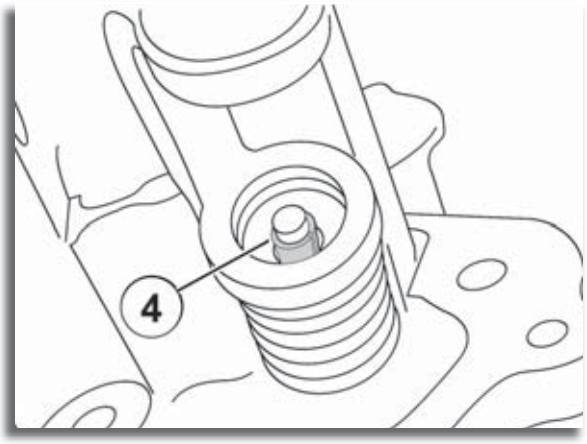
- Remove:
  - The upper cup (1).
  - The spring (2).
  - The valve (3).
  - Remove the 2nd valve in the same way.

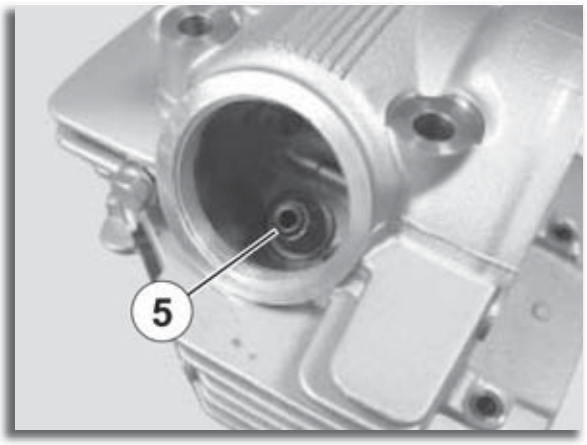


NOTE
WHEN RE-INSTALLING, LUBRICATE THE 2 HALF CONES (4) SO AS TO HOLD THEM IN THE GROOVE OF THE VALVE'S STEM.

NOTE
DO NOT PLACE THE 2 HALF CONES INTO THE CUP FORCEFULLY WITH THE TOOL WHEN DECOMPRESSING THE SPRING.

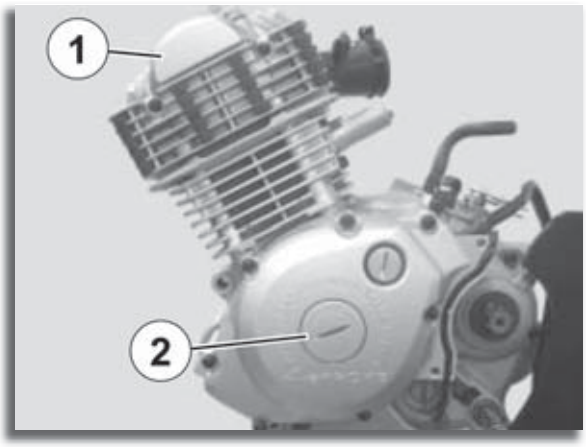


- In case you remove the seal of a valve stem (5), replace it with a new seal after removing all the carbon residues which could remain inside the cylinder head.

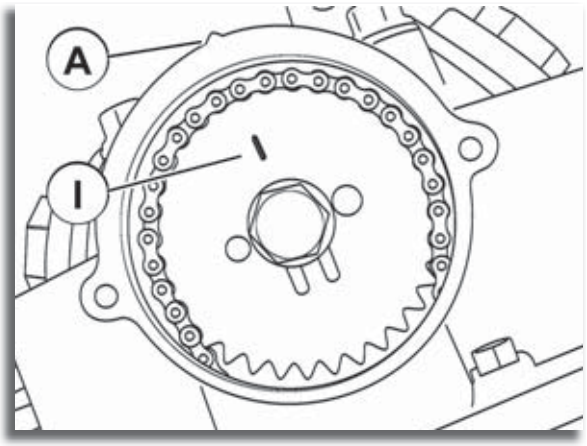


CHECKING THE VALVE CLEARANCE

• Removal of the camshaft gear cover (1).
• Removal of the central plug (2)..

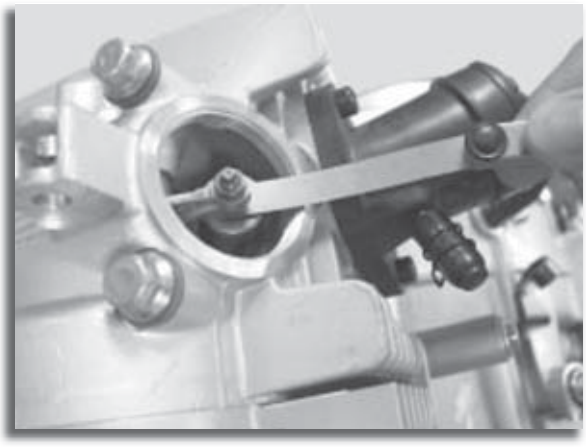


• Using a wrench, turn the crankshaft counterclockwise so as to align the crankshaft gear mark (I) with the cylinder head mark (A).



• Using the set of feeler gauges, measure the clearance of each valve.
Clearances:
- 10/100 at the intake.
- 15/100 at the exhaust.

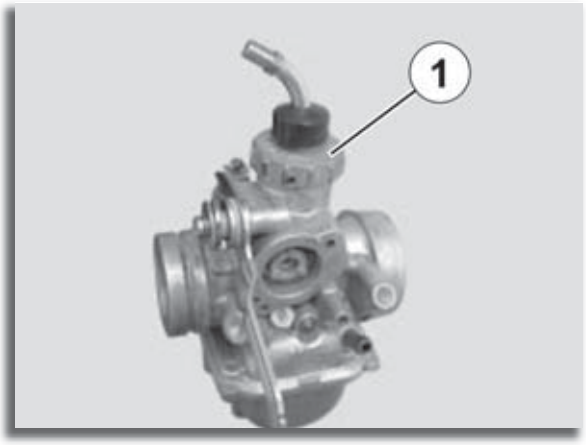
• If the clearance is not correct, adjust by means of the cam follower screw.



6 ENGINE

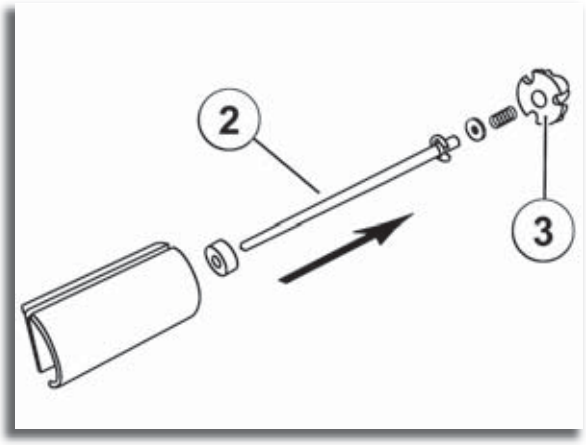
CARBURETTOR

REMOVAL OF THE THROTTLE VALVE

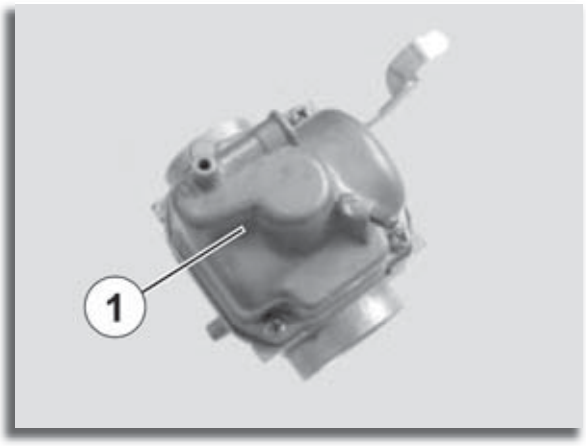


- Unscrew the carburettor chamber cap (1).
- Dismantle the valve equipped with its needle, spring and carburettor chamber cap.

- Dismantle the needle (2) by pushing it out in order to remove the clips (3).

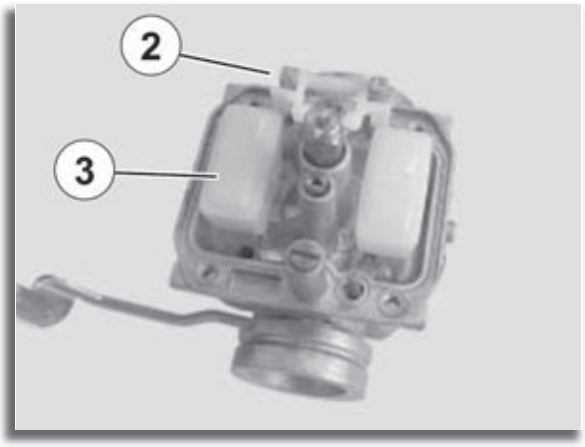


REMOVAL OF THE FLOAT, NEEDLE VALVE AND JETS

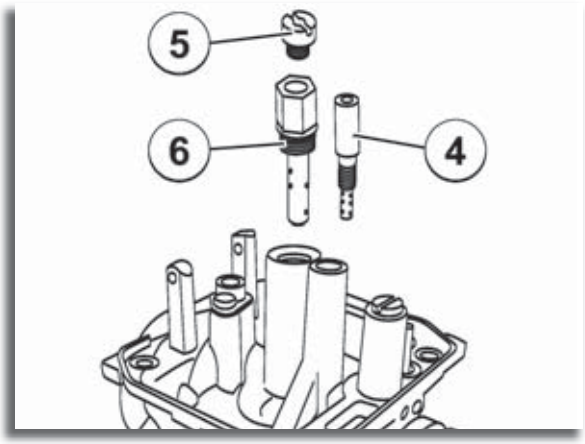


- Remove the 4 screws that secure the float chamber (1).
- Remove the chamber.

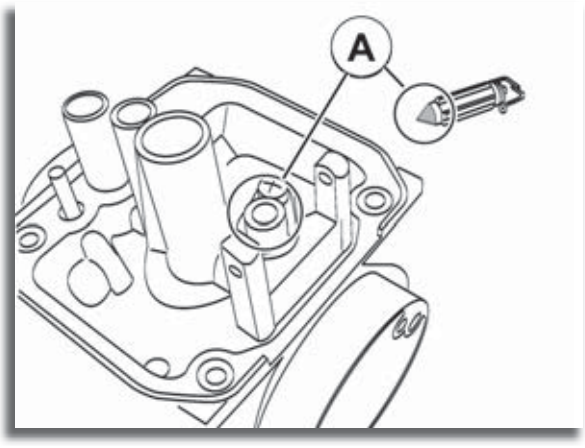
- Remove the paper gasket.
- Remove the float (3) pin (2).
- Remove the float and the needle valve.



- Remove the idle jet (4).
- Remove the main jet (5).
- Remove the jet spray nozzle (6).

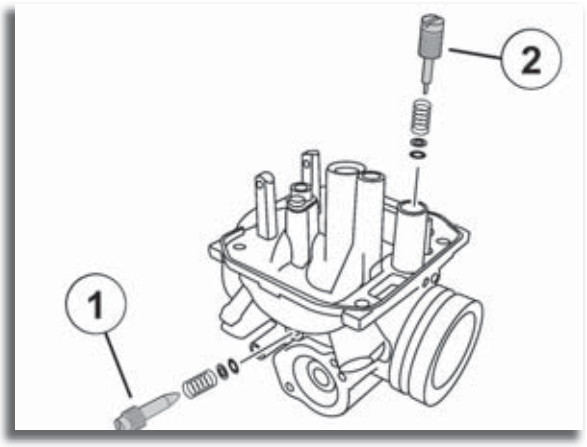


- Check the condition of the needle valve and the needle valve seat (A).



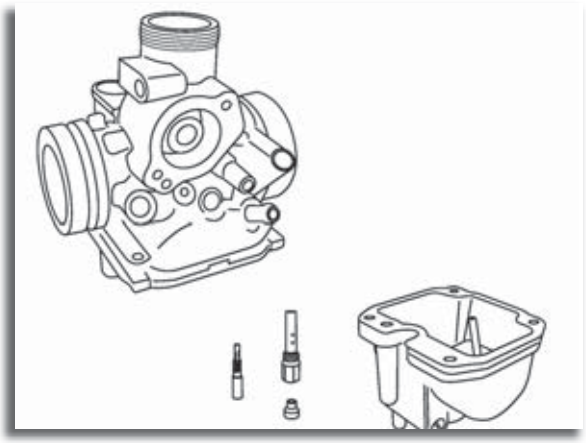
6 ENGINE

REMOVAL OF THE ENGINE SPEED ADJUSTER SCREW AND MIXTURE CONTROL SCREW



• Turn clockwise the engine speed adjuster screw (1) and mixture control screw (2) while counting the number of turns until they are screwed home.
• When re-fitting, this operation allows you to put them back to their initial adjutment position.
• Remove the idle screw and the mixture control screw with their spring.

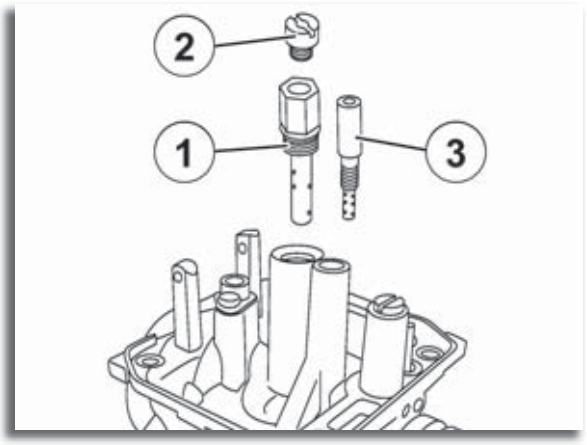
NOTE
DO NOT TURN THE SCREWS HOME FORCEFULLY.



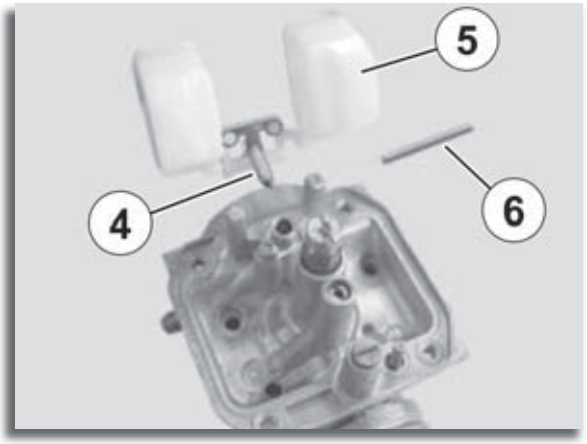
• Clean the body of the carburettor and its components with a cleanser.
• Blow into every jet and duct of the carburettor body with compressed air.

NOTE
DO NOT USE ANY METAL TOOL WHICH CAN DAMAGE THE DUCTS OF THESE ITEMS.

RE-FITTING THE JETS, FLOAT AND NEEDLE VALVE



- Fit the jet spray nozzle (1).
- Fit the main jet (2).
- Fit the idle adjuster screw (3).



- Position the needle valve (4) on the tongue of the float (5).
- Install the float on the carburettor body while fitting the needle valve into its recess.
- Fit the pin (6) into the float.
- Fit the paper gasket.
- Fit teh float chamber.
- Fit and tighten the 4 screws of teh float chamber.

- Re-install all the other components and, if necessary, when starting the engine, readjust according to the values indicated on the technical data card.

7 ADJUSTMENT

CONTENTS

TRANSMISSION CHAIN TENSION 131

LUTCH TENSION 132

THROTTLE CONTROL 132

TENSIONING THE FRONT BRAKE 133

TENSIONING THE REAR BRAKE 133

PEDAL CHANGING 134

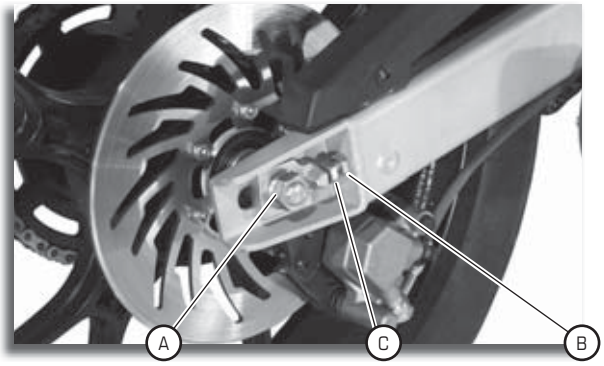
CARBURETTOR 134

7 ADJUSTMENT

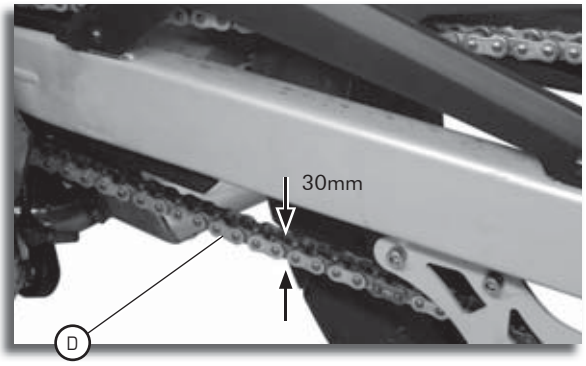
Set spanner

TRANSMISSION CHAIN TENSION

To adjust the tension of the transmission chain, the steps described below must be carried out on both sides.



- Loosen the two nuts (A) securing the rear wheel.
- Loosen the securing nut (B).
- Using the bolt (C), adjust the tension of the chain.
- The chain (D) should have a tolerance of some 30mm.
- Set the position using the securing bolt (B).
- Tighten the wheel shaft nuts (A).

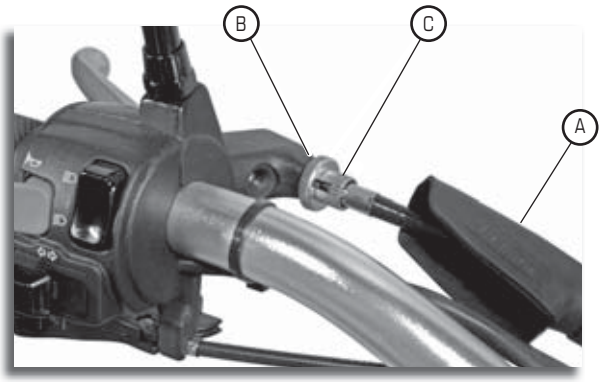


ADJUSTMENT

CLUTCH TENSION

To increase or decrease the clutch tension:

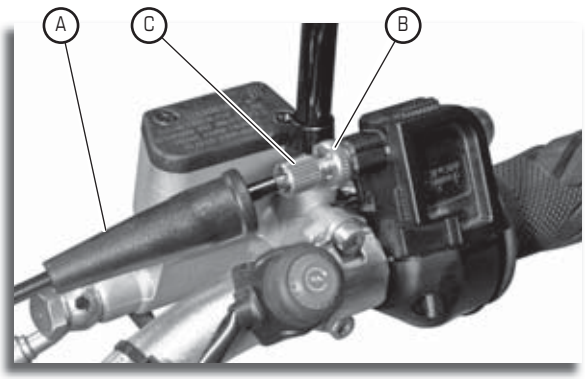
- Remove the protective rubber (A).
- Loosen the locking wheel (B).
- Turn the wheel (C) to tighten or loosen the cable.
- Use the locking wheel (B) to set the position.



THROTTLE CONTROL

To increase or decrease the throttle twist-grip tension:

- Remove the protective rubber (A).
- Loosen the locking wheel (B).
- Turn the wheel (C) to tighten or loosen the cable.
- Use the locking wheel (B) to set the position



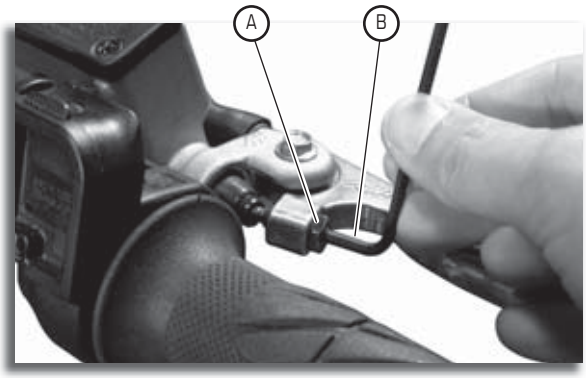
7 ADJUSTMENT

Allen key

TENSIONING THE FRONT BRAKE

To increase or decrease the tension of the front brake:

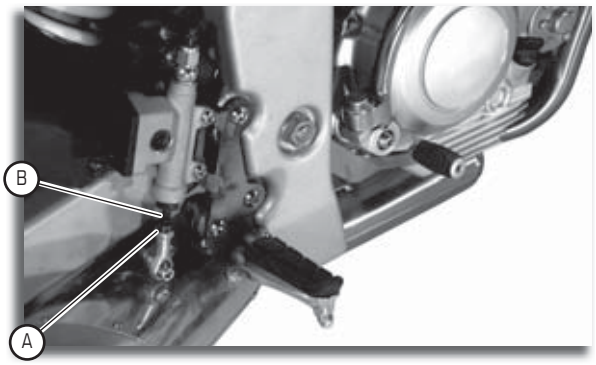
- Loosen the securing nut (A).
- With a No.4 Allen key (B), increase or decrease the action of the front brake.
- Use the securing nut (A) to set the position.



TENSIONING THE REAR BRAKE

To increase or decrease the tension of the rear brake:

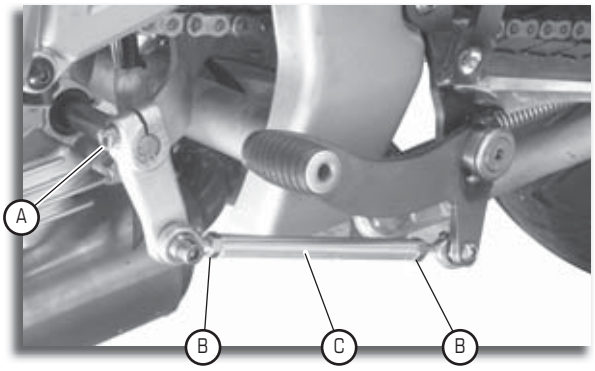
- Loosen the securing nut (A).
- Turn the threaded wheel (B) to increase or decrease the action of the rear brake.
- Use the securing nut (A) to set the position.



ADJUSTMENT

GEAR CHANGE PEDAL

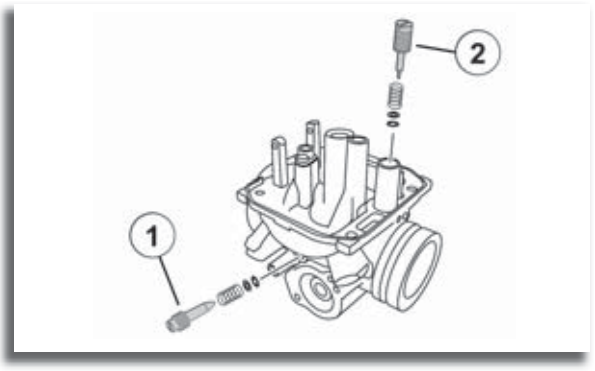
Adjust the position of the gear change pedal to adapt the position to your requirements.



- Put the gear change pedal in neutral position.
- Unscrew the bolt (A).
- Place in the desired position.
- Loosen the nuts (B).
- Adjust the tension using the bar (C).
- Set the position with the nuts (B).
- Set the position with the bolt (A).

CARBURETTOR

- Adjust the carburettor idling speed using the screws.
  - Idling speed (1).
  - Mixture (2).



8 MAINTENANCE

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REAR BRAKE FLUID 137

FLUID LEVEL 138

SPARK PLUG 138

AIR FILTER CLEANING 139

BRAKE PADS 139

TYRES 139

STEERING 140

MAINTENANCE PLAN 141

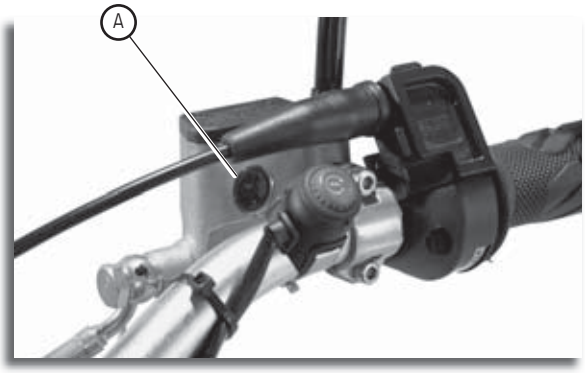
8 MAINTENANCE

Philips screwdriver

FRONT BRAKE FLUID

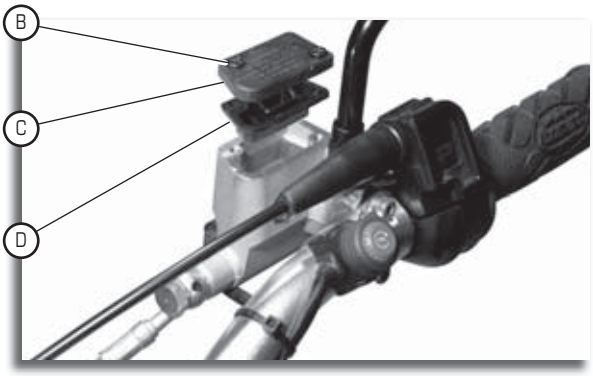
The brake fluid reservoir is next to the right-hand lever.

- There is an inspection window (A) in the reservoir to view the fluid level.



- Check that the level is correct. If not, carry out the following steps:
- Loosen the two bolts (B) from the cover.C
- Remove the cover (C) and the rubber (D).
- Top up with fluid, if necessary.

Recommended fluid DOT 3; DOT 4



Philips screwdriver

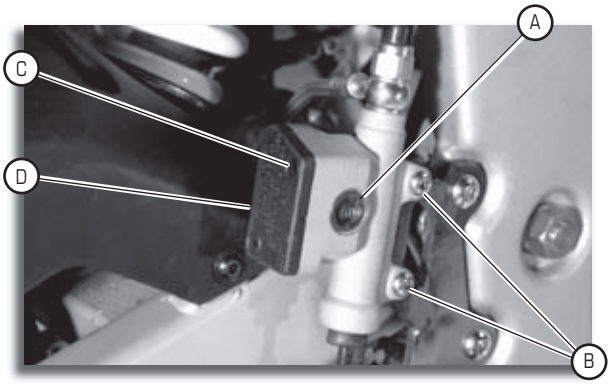
Allen key

REAR BRAKE FLUID

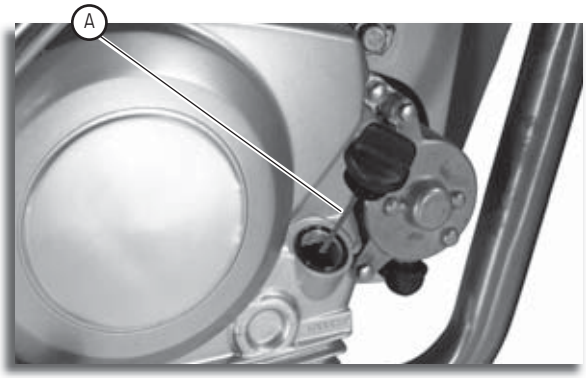
The brake fluid reservoir is located behind the lever.

- There is an inspection window (A) in the reservoir to view the fluid level
- Check that the level is correct. If not, carry out the following steps:
- Remove the two bolts (B) and place the reservoir in a horizontal position.
- Loosen the two bolts (C) on the cover (D).
- Remove the cover D) and the rubber.
- Top up with fluid, if necessary.

Fluid: DOT 3; DOT 4



OIL LEVEL



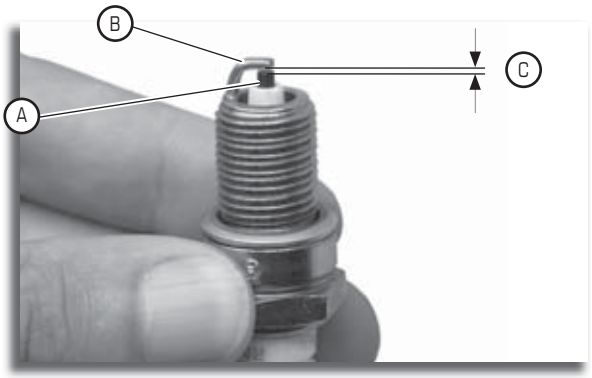
Before carrying out this operation, turn off the engine and remove the oil cap located on the right-hand side of the engine.

- The cap incorporates a dipstick (A) that will indicate the level of the oil.
- Remove the cap.
- Wipe the dipstick dry (A).
- Refit the cap.
- Remove the cap again and check the level marked on the dipstick (A).

Recommended oil: SAE 10W30.

SPARK PLUG

ATTENTION
BEFORE REMOVING THE SPARK PLUG, BLOW THE AREA AROUND IT WITH COMPRESSED AIR TO ELIMINATE ANY DIRT, TO ENSURE THAT NOTHING FALLS INTO THE ENGINE.



- Standard spark plug:
  CR6HSA
- Abnormal colour:
  Renew

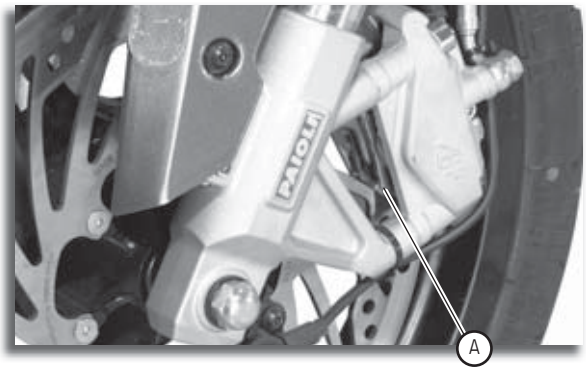
(The normal colour is light brown).

- Inspect:
  Electrode (A).
  Insulator (B).
- Measure:
  Gap between electrodes (C):
  0.6 mm - 0.7 mm

8 MAINTENANCE

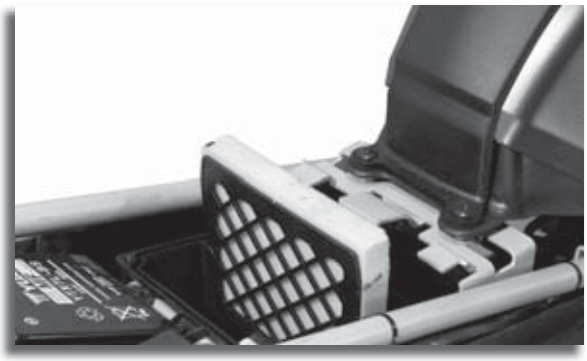
BRAKE PADS

- Measure the thickness (A) of the lining of the pads.
- Service limit (lining): 1mm.



CLEANING THE AIR FILTER

- Remove the air filter sponge.
- Wash with AGIP FILTER CLEAN,
- Rinse and dry the filter.
- Impregnate with AGIP FILTE oil.
- Eliminate the excess by pressure.



TYRES

Tyre pressure.

FRONT	REAR
1,5 bar	2 bar

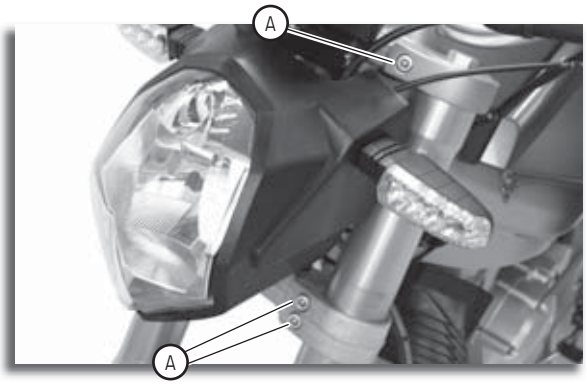
Minimum tread depth:

0,8 mm.

STEERING

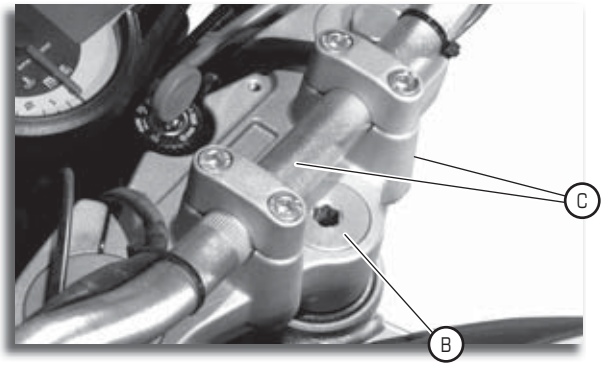
REMOVAL

- Loosen the 3 bolts (A) on the 2 plates.
- Remove the front calliper **(see section).**
- Free the wheel-forks assembly from the top plate.



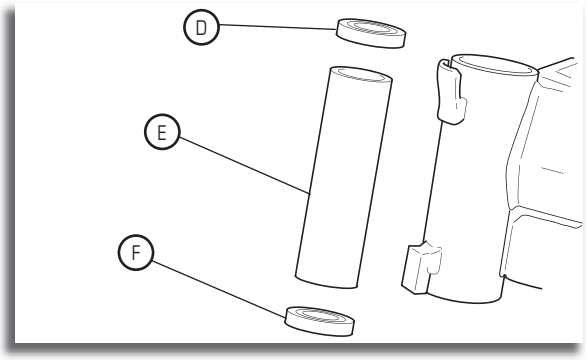
- Remove the plug (B) and the washer.
- Remove the top plate-handlebars assembly (C).

CAUTION
-PLACE THE MACHINE ON A FLAT SURFACE.
-STAND THE MACHINE ON A SUITABLE SUPPORT, IN SUCH A WAY THAT THE FRONT WHEEL IS OFF THE GROUND.



The inside of the steering:

- Remove the oil seal (D).
- Remove the spacer pipe (E).
- Remove the oil seal (F).



ASSEMBLY

- To assemble, carry out the operations in reverse order.

8 MAINTENANCE

This section includes all the information needed for performing all the recommended maintenance and commissioning operations. Observing these procedures will ensure the machine functions more reliably and has a longer useful life, while reducing the need for costly repair work.

REINFORCED MAINTENANCE PLAN

Reinforced maintenance is aimed at machines used in "severe" conditions: driver mood, short journeys with a cold engine, dusty regions or an ambient temperature of above 30°C.

CHECK

MAINTENANCE OPERATIONS	500 km or 3 months	Every 3.000 km	Every 6.000 km
REINFORCED MAINTENANCE		**Every 1.500 km**	**Every 3.000 km**
Adjust idling speed	X	X	X
Throttle cable and oil pump	X	X	X
Front and rear brake cables	X	X	X
Functioning of the front and rear brakes	X	X	X
Functioning of the electrical equipment	X	X	X
Fuel circuit	X	X	X
Oil circuit	X	X	X
Front and rear brake fluid piping	X	X	X
Coolant circuit	X	X	X
Carburettor heating circuit	X		
Tyre pressures		X	X
Condition, pressure and wear of tyres	X	X	X
Front and rear brake fluid level	X	X	X
Coolant level	X	X	X
Battery electrolyte level	X	X	X
Tightening nuts and bolts		X	X
Charging the battery		X	X

RENEWING

MAINTENANCE OPERATIONS	500 km or 3 months	Every 3.000 km	Every 6.000 km
REINFORCED MAINTENANCE		**Every 1.500 km**	**Every 3.000 km**
Intake filter element		X	X
Front and rear brake pads (where appropriate)		X	X
Gearbox oil	X		X
Chain-sprocket-crown wheel (where appropriate)		X	X
Clutch disks (where appropriate)			X

CHECKING AND DECARBONISING

MAINTENANCE OPERATIONS	500 km or 3 months	Every 3.000 km	Every 6.000 km
REINFORCED MAINTENANCE		**Every 1.500 km**	**Every 3.000 km**
Piston			**Every 10.000 km**
Cylinder head			**Every 10.000 km**
Exhaust port			**Every 10.000 km**

(1) The need to decarbonise can be estimated by checking the quantity of carbonisation present in the cylinder exhaust outlet.

CHECKING AND GREASING

MAINTENANCE OPERATIONS	500 km or 3 months	Every 3.000 km	Every 6.000 km
REINFORCED MAINTENANCE		**Every 1.500 km**	**Every 3.000 km**
Chain tension and condition	X	X	X

CHECKING AND ADJUSTING

MAINTENANCE OPERATIONS	500 km or 3 months	Every 3.000 km	Every 6.000 km
REINFORCED MAINTENANCE		**Every 1.500 km**	**Every 3.000 km**
Clutch cable	X		X
Oil pump control	X		X
Spark plug	X	X	X
Tension of the wheel spokes	X	X	X

CHECKING AND ADJUSTING

MAINTENANCE OPERATIONS	500 km or 3 months	Every 3.000 km	Every 6.000 km
REINFORCED MAINTENANCE		**Every 1.500 km**	**Every 3.000 km**
Carburettor		X	X

9 TROUBLESHOOTING

ÍNDICE

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FAULTY GEAR-CHANGE 146

FAULTY CLUTCH 147

OVERHEATING 147

POOR BRAKING 147

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UNSTABLE HANDLING 148

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9 TROUBLESHOOTING

N.B.:
The following troubleshooting guide does not cover all the possible causes of faults. It may however prove useful as a guide for basic fault findingUse this manual to consult the corresponding checking, adjusting and part renewal procedures.

FAILURE TO START

ENGINE

. Loose park plug.
. Cylinder or cylinder head damaged.
. Damaged cylinder head gasket.
. Damaged cylinder gasket.
. Cylinder worn or damaged.
. Incorrect valve clearance.
. Seized valve.
. Wrongly fitted piston ring.
. Damaged, worn or fatigued piston ring.
. Seized piston ring.
. Seized or damaged piston.
. Air filter incorrectly fitted.
. Air filter element obstructed.
. Crankcase fitted incorrectly.
. Seized crankshaft.Cylinder head gasket damaged

FUEL SYSTEM

. Fuel tank empty.
. Fuel tank drain pipe blocked.
. Altered or contaminated fuel.
. Carburettor air suction blocked.

ELECTRICAL SYSTEMS

. Flat battery.
. Faulty battery.
. Fuse blown, damaged or incorrect.
. Fuse fitted incorrectly.
. Incorrect spark plug gap.
. Oiled-up spark plug.
. Electrode worn or damaged.
. Insulation worn or damaged.
. Faulty spark plug cap.
. Primary or secondary coils broken or short-circuited.
. Faulty spark plug cable.
. Faulty main switch.
. Faulty engine stop switch.
. Broken or short-circuited wiring.
. Faulty neutral light switch.
. Faulty starter switch.
. Loose connections.
. Faulty starter motor.

INCORRECT IDLING SPEED

ENGINE

. Incorrect valve clearance.
. Air filter element obstructed.

FUEL SYSTEM

. Incorrectly adjusted engine idling.
. Incorrect throttle cable clearance.
. Flooded throttle body.
. Faulty air intake system.

ELECTRICAL SYSTEMS

. Flat battery.
. Faulty battery.
. Fuse blown, damaged or incorrect.
. Fuse fitted incorrectly.
. Incorrect spark plug gap.
. Oiled-up spark plug.
. Electrode worn or damaged.
. Insulation worn or damaged.
. Faulty spark plug cap.
. Primary or secondary coils broken or short-circuited.
. Faulty spark plug cable

FAULTY GEAR-CHANGE

DIFFICULTY CHANGING GEAR

See “The clutch is dragging” in this section.

THE GEAR PEDAL DOES NOT MOVE

. Bent gear-change shaft.
. Foreign object in the selection drum slot.
. Seized gear change fork.
. Bent gear-change fork guide bar.
. Seized gearbox gearing.
. Foreign object between the gearbox gears.
. Incorrectly fitted gearbox.

THE GEARS JUMP

. Incorrect gear change pedal position.
. Incorrect stop lever return.
. Worn gear selector fork.
. Worn selection drum slot.
. Worn gear securing device.

9 TROUBLESHOOTING

FAULTY CLUTCH

THE CLUTCH SLIPS

. Clutch incorrectly fitted.
. Clutch cable incorrectly adjusted.
. Loose or fatigued clutch spring.
. Worn friction plate.
. Worn clutch plate.
. Incorrect oil level.
. Incorrect oil viscosity (low).
. Oil altered.

THE CLUTCH DRAGS

. Uneven clutch spring tension.
. Bent pressure plate.
. Bent clutch plate.
. Distorted friction plate.
. Bent clutch push bar.
. Broken clutch lobe.
. Marks not aligned.
. Incorrect oil level.
. Incorrect oil viscosity (high).
. Oil altered.

OVERHEATING

ENGINE

. Coolant passages blocked.
. Large accumulation of carbon deposits.
. Incorrect oil level
. Incorrect oil viscosity.
. Inferior oil quality.

CHASSIS

. Brakes activated.

ELECTRICAL SYSTEMS

. Incorrect spark plug electrode gap.

POOR BRAKING:

. Worn brake pads.
. Worn brake disk.
. Air in the hydraulic brake system.
. Leaking brake fluid.
. Damaged brake calliper seal.
. Damaged brake pipe.
. Oil or grease on the brake disk.
. Oil or grease on the brake pad.
. Incorrect brake fluid level.

DAMAGED FRONT FORK ARMS

LEAKING OIL

. Inner tube bent, damaged or rusted..
. Outer tube cracked or damaged.
. Oil seal fitted incorrectly.
. Damaged oil seal lip..
. Incorrect fluid level (high).
. Loose shock absorber bar assembly bolt.
. Damaged shock absorber bar assembly copper washer.

INCORRECT FUNCTIONING

. Inner tube bent or damaged.
. Outer tube bent or damaged.
. Damaged forks spring.
. Outer tube hose worn or damaged.
. Shock absorber bar bent or damaged.
. Incorrect oil viscosity.
. Incorrect oil level.

UNSTABLE HANDLING

. Handlebars bent or incorrectly fitted.
. Top support incorrectly fitted.
. Bottom support fitted incorrectly (badly tightened lock nut).
. Bent steering shaft.
. Damaged ball bearings or bearing guide ring.
. Uneven fluid levels (in the two front fork arms).
. Uneven fork spring tension (in the two front fork arms).
. Broken fork spring.
. Inner tube bent or damaged.
. Outer tube bent or damaged.
. Worn bearing or hose.
. Swinging arm bent or damaged.
. Faulty rear shock absorber spring.
. Oil or gas leak.
. Uneven tire pressures (front and rear).
. Incorrect tyre pressure.
. Uneven tyre wear.
. Incorrect wheel balancing.
. Broken or loose spokes.
. Damaged wheel bearing.
. Bent or loose wheel shaft.
. Excessive decentring of the wheel.
. Bent frame.
. Damaged steering column tube.
. Incorrectly fitted bearing guide ring.

9 TROUBLESHOOTING

FAULTY LIGHTS OR TURN INDICATOR SYSTEM

THE HEADLIGHT DOES NOT COME ON

. Incorrect headlight bulb.
. Too many electrical accessories.
. Excessive load
. Incorrect connection.
. Circuit incorrectly connected to earth.
. Faulty contacts (main switch).
. Blown headlight bulb.

BLOWN HEADLIGHT BULB

. Incorrect headlight bulb
. Battery faulty
. Headlight bulb blown

THE REAR LIGHT / BRAKE LIGHT DOES NOT COME ON

. Blown rear light bulb / Brake light bulb.
. Too many electrical accessories.
. Incorrect connection.
. Blown rear light bulb / Brake light bulb.

BLOWN REAR LIGHT BULB / BRAKE LIGHT BULB

. Incorrect rear light/brake light bulb.
. Battery faulty.
. Incorrectly adjusted rear brake light switch..
. Rear light/brake light bulb reached end of life.

THE TURN INDICATORS DO NOT COME ON

. Faulty turn indicator switch.
. Blown turn indicator bulb.
. Incorrect connection.
. Damaged or faulty wiring loom.
. Battery faulty.
. Fuse blown, damaged or incorrect.

THE TURN INDICATORS BLINK SLOWLY

. Faulty turn indicator switch.
. Incorrect turn indicator bulb.

THE TURN INDICATORS BLINK RAPIDLY

. Incorrect turn indicator bulb.
. Blown turn indicator bulb.

THE HORN DOES NOT SOUND

. Horn incorrectly adjusted.
. Horn damaged or faulty.
. Faulty horn switch.
. Battery faulty.
. Fault in wiring loom.

MOTORCYCLES

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